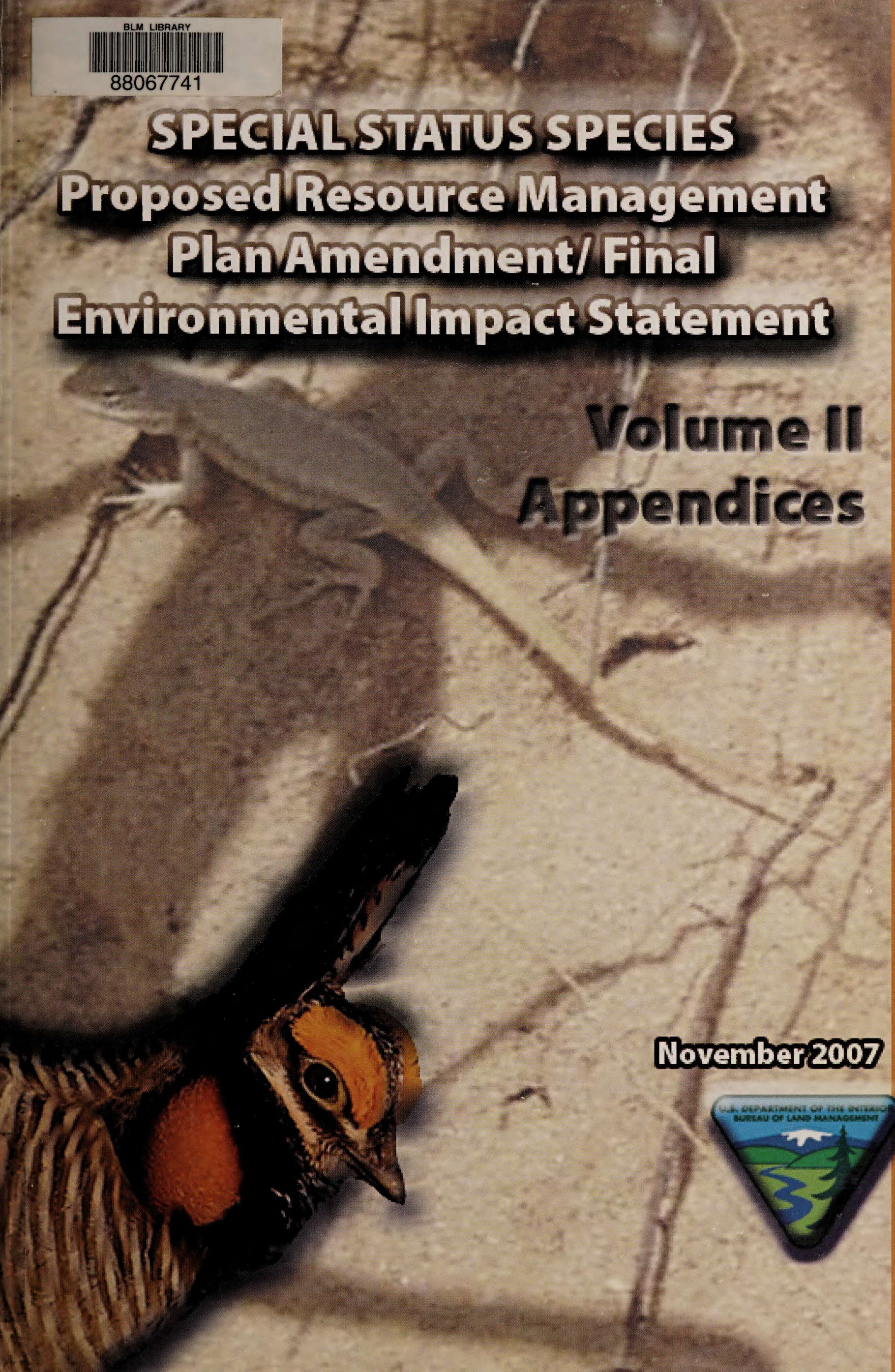
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SPECIAL STATUS SPECIES
Proposed Resource Management Plan Amendment/ Final Environmental Impact Statement

Volume II
Appendices



November 2007

U.S. DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

Pecos District Office, Roswell, New Mexico

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APPENDIX 1
INTERIM MANAGEMENT

Goal - Maintain existing habitat and management options in the shinnery oak-sand dune habitat complex until the Resource Management Plan Amendment (RMPA) for special status species is approved. Interim management would be applied in what is now the Planning Area for the RMP Amendment.

OBJECTIVES FOR INTERIM MANAGEMENT

- Maintain existing habitat for the lesser prairie-chicken and sand dune lizard and preclude degradation of suitable habitat until planning process addresses the issue.
- Support strategies that conserve the lesser prairie-chicken and sand dune lizard and assist in precluding the need for listing either species as threatened or endangered.
- Leave the options open for recovery of both species.
- Involve interested parties and stakeholders using the 4 C's.
- Work within existing authorities and plans.

See Map C-1 in Map Section of the RMPA.

MINERAL LEASING AND DEVELOPMENT WITHIN THE ROSWELL FIELD OFFICE & CARLSBAD FIELD OFFICE PLANNING AREA

This will be a phased approach into evaluating oil and gas leasing and development within the lesser prairie-chicken and sand dune lizard habitat areas. Careful consideration of mineral leasing and development needs to be taken during the interim to avoid making land management decisions that may adversely affect special status species. The following are conditions and criteria for mineral leasing and development within the Planning Area.

Sand Dune Lizard

Regardless of the Zones described below, deferring new leasing of Federal minerals will occur for all Management Zones that have occupied or suitable lizard habitat. Deferral of new leasing would result in the protection of critical sand dune lizard habitat until further analysis can be made through the plan amendment process.

MANAGEMENT ZONES: ZONE 1 - Defer Leasing And Plan Of Development (POD) For Existing Leases.

Defer New Leasing: This Zone includes the Roswell Core Area, the New Mexico Department of Game and Fish (NMDGF) lesser prairie-chicken management areas and a 1.5-mile radius around lesser prairie-chicken booming grounds outside the Roswell Core and NMDGF lesser prairie-chicken management areas. This will include a large portion of occupied and suitable sand dune lizard habitat currently having minimal oil and gas development on existing leases. Exceptions to the defer-new-leasing prescription may be considered on case-by case basis for unitization and drainage purposes, or for parcels that are insignificant in size. Granting exceptions will require a thorough review of habitat suitability, lek locations and cumulative

impacts that would potentially occur if the exception is granted.

Rationale: Leasing and subsequent development would significantly impact the suitability of the area by direct disturbance to booming grounds, fragmentation of nesting habitat and losing the connectivity of important habitats on the landscape. Deferral of new leasing would result in the protection of critical sand dune lizard habitat until further analysis can be made through the plan amendment process.

POD For Existing Leases: This would be required before the approval of the next well to be drilled within an existing lease. The POD would require disclosure of all future well locations, well infrastructure (tanks, compressors, power lines/poles, etc), and rights-of-ways that would access future wells. To the extent possible, a 1.5 mile buffer zone where drilling will be excluded (buffer zone) will be utilized around active leks (those active within the last 3 years) to provide interim resource protection in conjunction with the current timing stipulation.

Rationale: Lease holders have valid rights to develop the lease; however, the BLM can require a POD for orderly development of leases and to minimize surface disturbance and fragmentation to protect occupied and suitable lesser prairie-chicken/sand dune lizard habitat.

MANAGEMENT ZONES: ZONE 2 - New Leasing With A No Surface Occupancy (NSO) Stipulation And Pod For Existing Leases

See Map A-1 in the Map Section of the RMPA for location.

Zone 2 contains lesser prairie-chicken/sand dune lizard occupied and suitable habitat that is mostly leased with lighter amounts of development. The Zone 2 area on the Chaves-Eddy County line contains unleased parcels that are critical for the development of a corridor to connect the major core areas to the north and to the southern historic range. Zone 2 areas are also very significant in maintaining the narrow band of occupied habitat for the sand dune lizard. This narrow band is due to the natural landscape pattern and is approximately 5-miles wide. New leasing with NSO stipulation would be applied on those lands associated with lesser prairie-chicken/sand dune lizard habitat core areas in the Roswell and Carlsbad Field Offices. After completion of the RMPA, the NSO stipulation may be dropped, modified or carried forward. A notice explaining these procedures will be attached to the nominated lease parcels at the time of leasing.

Rationale: Most of the Federal mineral reserves in this area should be accessible by current adjacent leases. Adjacent leased lands will generally have either some level of existing oil & gas development or contain lower quality lesser prairie-chicken/sand dune lizard habitat. The NSO requirement would protect occupied and suitable habitat while allowing development from adjacent existing leases.

The POD: A POD for existing leases would be required before the approval of the next well to be drilled within an existing lease. The POD would require disclosure of all potential well locations, well infrastructure (tanks, compressors, power lines/poles, etc), and rights-of-ways that would access future wells. To the extent possible, a buffer zone around active leks and the current timing stipulation will be utilized to provide interim resource protection.

Rationale: Lease holders have valid rights to develop the lease; however, the BLM can require a POD for orderly development to protect occupied and suitable lesser prairie-chicken/sand dune lizard habitat.

MANAGEMENT ZONES: ZONE 3 - Require Pod For New And Existing Leases.

See Map A-1 in the Map Section of the RMPA for locations.

Zone 3 contains isolated blocks of unfragmented suitable lesser prairie-chicken/sand dune lizard habitat that have been leased and for the most part developed. Within Roswell Field Office, several of the Zone 3 areas lay within the northern extent of the Carlsbad Field Office lesser prairie-chicken area and are key management areas for future expansion and connectivity of habitats and population interchange. Within the Carlsbad Field Office, these areas include habitat within a 1.5-mile radius of known historic lek sites and will also provide management consideration around Zone 2 areas described earlier. These areas will have the noise and timing stipulation applied to oil and gas activities and other potential disturbance along with the POD. Zone 3 also includes areas that contain habitat parameters that are needed for the life cycle of the species (e.g., edge) and with habitat manipulation could become suitable habitat. Also included in this zone are some areas with Federal minerals under private or state surface where management of other uses is not controlled by the BLM.

The POD: A POD for existing leases would be required in appropriate habitat areas before the approval of the next well to be drilled within an existing lease. The POD would require disclosure of all potential well locations, well infrastructure (tanks, compressors, power lines/poles, etc), and rights-of-ways that would access future wells. To the extent possible, a buffer zone around active leks and the current timing stipulation will be utilized to provide interim resource protection.

Rationale: Federal minerals in this Zone are leased with only a few small, scattered tracts of unleased Federal minerals. Lease holders have valid rights to develop the lease; however, the BLM can require a POD for orderly development to protect suitable lesser prairie-chicken habitat.

MANAGEMENT ZONES: ZONE 4 - Issue New Leases With Existing RMP Stipulations And Use The Existing Conditions Of Approval For Development Of Existing Leases.

These areas are generally on the outer edge of the range of these two species. (See map for locations). Some of the areas are outside the proposed planning area boundary but are still within the timing stipulation boundary that may require some level of management until habitat evaluations and decision are made in the upcoming plan amendment.

Rationale: This area is on the outer edge of the range of these two species. (See map for locations). New leases would include lesser prairie-chicken/sand dune lizard stipulations approved in the 1997 Roswell RMP and Carlsbad RMPA where appropriate. Currently, there are areas outside the proposed planning area boundary but are still within the timing stipulation boundary that may require some level of management until habitat evaluations and decisions are made in the upcoming plan amendment.

Other Land Uses

Livestock Grazing: Within the entire RMPA Planning Area, livestock grazing will be authorized under the grazing permit renewal process. Any changes to current livestock management will be based on vegetative monitoring, lesser prairie-chicken suitability monitoring (Robel), and rangeland health assessments for Standards and Guidelines and in consultation with the permittees.

Off-Highway-Vehicles (OHV): Formal designations within the Roswell portion of the Planning Area include closed to OHV use in the Mathers Research Natural Area

and the Mescalero Sands ACEC; open to OHV use in the Mescalero Sands North Dune OHV Area; and OHV use limited to existing roads and trails in the rest of the planning area within the Roswell Field Office. Pending formal designation through the plan amendment process, OHV use will be limited to limited to existing roads and trails within Roswell Field Office except for the closed areas identified above.

Under Interim Management, all land in the Planning Area within the Carlsbad Field Office that is currently designated as open to OHV use will be temporarily designated as limited to existing roads, trails, or ways. Exceptions in Carlsbad Field Office are the Alkali Lake and Hackberry Lake Intensive OHV areas which will continue to be designated as open to OHV use.

Reclamation: Apply the best management practices (BMPs) being developed in the Carlsbad Field Office/Roswell Field Office.

Best Management Practices

A description of best management practices (BMPs) for fluid minerals can be found at the BLM web site: *www.blm.gov/nhp/300/wo310/O&G/Ops/operations.html.*

In addition to these BMPs, the Roswell and Carlsbad Field Offices developed the following BMPs for reclamation:

1. Site development – the smaller the area of surface disturbance, the less reclamation effort will be needed. Start with the end result in mind.

- Minimize well pad sized by leveling or clearing only what is needed for the rig, pits, and tanks.

- Build the shortest road possible utilizing the existing road network.

- Road surfacing should be limited to soils and topography that require surfacing to reduce soil erosion. As a general rule, if spur roads require surfacing, then the minimum six-inch compacted layer of surface material should be applied.

- Reserve pits should be constructed so that upon completion of drilling operations, the dried pit contents will be a minimum of 3 feet below ground level. Should these contents not meet the 3-foot minimum depth requirement, the contents shall be removed and disposed of at an authorized location. The rationale is that a deeper layer of soil/dirt over the pit liner allows a greater chance of establishing plants on the site.

- Whenever possible, pipelines should parallel existing roads.

- Clearing vegetation for pipelines should be kept to a minimum. In some locations, only trenching may be necessary.

2. Post-well completion

- Reclaim any disturbed areas outside the radius of the guy line anchors or any lands not necessary for well operations using the methods detailed in well abandonment. This area to be reclaimed would be delineated by BLM's authorized officer.

3. Well abandonment - The idea is to prepare a site (any time of the year), then applying seed and fertilizer just before seasonal rains.

- Where practical, remove caliche surfacing from pads and roads prior to ripping. Roswell Field Office recognizes there are specific sites and situations in which the caliche is so degraded that removal would not be efficient or very beneficial. There are several options of

what to do with the caliche including returning the caliche to pits, applying the caliche to maintain main roads or stockpiling material for future use.

- To minimize soil compaction, pads and roads should be ripped to a depth of between 18 to 24 inches, using either a winged ripper or ripped in two directions perpendicular to each other.

- After ripping, leave the site rough or fallow for one growing season. This should allow breakdown of the clods, and allow other soil particles as well as seeds to blow into the ripped area.

- Fertilizer will assist the seeds in growing and give better plant vigor once they start to grow for more success. Chemical fertilizers have provided mixed results, especially in drought conditions. Organic treatments, such as nutrient fixing bacteria or sterilized manure may be more effective.

- Seed and fertilize the ripped area within a prescribed window to allow the best chance of germination and establishment. Depending on the soil type and depth, the operator would be required to either broadcast seed or use a seed drill to seed the area. The site should be lightly watered after seeding and packed with an imprinter. This allows for the soil to crust over which should assist in retaining seed and minimize loss due to winds.

- Temporarily fencing an area, usually the pad, to exclude livestock, other grazers, and physical impacts to the area would be required until plants have established themselves. The type or kind of fences would be approved by BLM.

- Mulching and irrigating a site is recommended but not required and would be conducted at the operator's discretion.

4. Measuring reclamation success – our reclamation goal is to approach the vegetation composition of the undisturbed surrounding area.

- Reclamation (efforts and success) would meet the satisfaction of the authorized officer before the operator would be released from reclamation responsibilities.

- Roswell Field Office will use the Desired Plant Communities (DPCs) as described in the Roswell RMP for determining seed mixtures. The DPCs also include a range of plants by percent composition that will be used to determine satisfactory reclamation.

- Roswell Field Office acknowledges that there will always be some amount of subjectivity regarding successful reclamation. Roswell Field Office, however, will include scientifically acceptable sampling methods, such as pace transects, when making decisions quantifying reclamation success.

Appendix 2



APPENDIX 2
COLLABORATIVE CONSERVATION STRATEGIES FOR THE LESSER PRAIRIE-CHICKEN AND SAND DUNE LIZARD IN NEW MEXICO

Findings and recommendations of the New Mexico
LPC/SDL Working Group

The New Mexico
LPC/SDL Working Group

August 2005

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Executive Summary

After more than two years of negotiations, a broad strategy for the protection of two at-risk species in southeastern New Mexico has been agreed to by state and federal agencies, ranchers, oil and gas industry representatives, and conservation interests. This document presents the findings and recommendations of the New Mexico LPC/SDL Working Group, a multi-party group of stakeholders with interests in conservation management and land use decisions regarding two candidate species for federal listing under the Endangered Species Act: the Lesser Prairie-Chicken (LPC) and Sand Dune Lizard (SDL). One of the first achievements of its kind addressing multiple candidate species, this report outlines a comprehensive approach for reducing biological threats while affirming and protecting economic values and traditional land uses. It applies across a large region including portions of Quay, De Baca, Curry, Chaves, Roosevelt, Eddy, and Lea counties.

Candidate Species and the Southeast New Mexico Working Group

The LPC is a prairie grouse species native to the southern Great Plains, including parts of Colorado, Kansas, New Mexico, Oklahoma, and Texas. The SDL is a lizard species native to a small area of southeastern New Mexico and west Texas. As candidate species, both have been ruled warranted for listing as threatened or endangered by the U.S. Fish and Wildlife Service. Central concerns for both species are the loss, fragmentation or alteration habitat.

Concerned over the status of the two species, state and federal agencies and the Wildlife Management Institute proposed in late 2002 that a "Working Group" of appropriate public and private stakeholders begin meeting to devise a collaborative conservation strategy. Following a period of formal status assessment and recruitment, the Working Group began meeting in January 2003 under the guidance of a professional facilitation team. **The goal statement adopted by the Working Group was:**

> To create a conservation strategy for the management of shinnery oak and sand sage grassland communities in southeastern and east-central New Mexico, recommending a range of specific actions to enhance and secure populations of Lesser Prairie-Chickens and Sand Dune Lizards, so that federal or state listing of these species is not needed, while protecting other uses of the land.

To design a consensus strategy aimed at protecting both vulnerable species and human livelihoods, representatives had to reach a high level of shared understanding regarding the biology of the two species. Equally important, stakeholders had to develop a knowledge of and concern for each other's economic and other interests, particularly in the context of how these might be affected by any proposed conservation action. Shared understandings were achieved by thorough review and discussion of scientific and management literature, and months of communication between the affected parties.

Lesser Prairie-Chicken

"Sand shinnery" communities, dominated by dwarf shinnery oak and grasses, constitute the majority of LPC habitat in southeastern New Mexico. The life cycle of the LPC revolves around the social groupings known as leks, and mating display areas known as lek sites. Although located in open areas, lek sites can exist only where suitable tall grass and shrub cover for nesting, brood-rearing, and winter feeding can all be found in fairly close proximity. Quality nesting habitat is thought to be the primary driver of LPC population growth or decline.

Climatic variation on seasonal, annual, or longer timescales is an important determinant of habitat quality for LPCs in New Mexico. Population increases associated with above-average rainfall in the 1980s were followed by a steep downward trend in the dry 1990s. Livestock grazing also plays a major role in determining habitat quality. Heavy grazing may reduce or eliminate residual tall grass cover needed for nesting, particularly in years of low rainfall. Habitat quality may also be reduced by the spread of mesquite or other shrubs, and by improper or excessive use of herbicides for shinnery oak control.

Overall LPC population size and geographic range have been greatly reduced since the 1800s due to the widespread conversion of native prairie grasslands to agricultural uses. LPC populations still contend with habitat loss and fragmentation due to various forms of development and changing land uses. Conversion of rangeland habitat to irrigated agriculture continues in some areas of east-central New Mexico. Roads and infrastructure development associated with the oil and gas industry have led to reductions in usable habitat, particularly in the southeast. Such impacts are heightened by the LPC's tendency to avoid nesting near areas of human activity or large structures.

The planning area has been classified into three management regions, based on LPC population status (see Map 3). These follow a general north-south pattern, and include a Sparse and Scattered Population Area (SSPA) where leks are present in low numbers and isolated from one another, a Primary Population Area (PPA) where over 90% of the state LPC population resides, and an Isolated Population Area (IPA) in the south where a single known lek and small scattered groups of birds remain.

Sand Dune Lizard

Distribution of the SDL is restricted to sand dune habitat in Lea, Eddy and south Chaves counties. The SDL occurs only in large and deep sand dune "blowouts" (open, low-lying areas between active dunes) in areas dominated by shinnery oak. SDL populations may be threatened by activities that remove shinnery oak, or otherwise alter the configuration of shrub and grass cover and blowout patches in dune areas. The two main threats faced by the SDL are the removal of shinnery oak by herbicide application, and disturbance of dune areas by roads and infrastructure from activities such as oil and gas development.

Land uses and economic interests

Ranching

Ranching is the predominant land use in sand shinnery habitat in New Mexico. Livestock grazing contributes significantly to the regional economy, and area ranchers have expressed a

strong interest in avoiding the need for federal listing of species. Most ranches include both private land and federal or state allotments. The loss or severe restriction of a grazing permit may result in an entire operation becoming no longer viable, and also affects property values. Thus the Working Group recognizes that ranchers who voluntary adopt grazing practices intended to benefit at-risk species should receive appropriate economic compensation, as well as protection from future additional regulatory burdens in the event of listing.

Oil and Gas

The planning area of southeastern and east-central New Mexico is also one of the major petroleum-producing regions of the United States. Across the area roughly 10,000 people are directly employed in oil and natural gas extraction, and some 23,000 are employed in related occupations. Much of the economic well-being of this region is tied to the employment, royalties, and taxes generated by petroleum production. Land management decisions that restrict or preclude full mineral development of certain state and federal lands thus affect the flow of revenues into local and state economies.

Conservation Recommendations

Lesser Prairie-Chicken Strategies

Working Group strategies for the LPC are divided into nine "pathways" focusing on different types of conservation or management actions. Pathways 1-5 present sets of recommendations designed to address all major categories of threat facing the species. Pathways 6-9 describe support strategies for on-the-ground efforts. In addition to the three management regions listed above, the Working Group recognizes the existing Roswell Bureau of Land Management (BLM) Core Management Area (CMA) for the LPC. These four geographic units reflect important differences not only in species conservation status, but also in patterns of land use and surface ownership.

Pathway 1 addresses the need to maintain quality rangeland habitat for nesting and brood-rearing, and presents specific standards for evaluating habitat quality. Key recommendations include:

- Establishment of a coordinated program of financial compensation for ranchers who choose to manage grazing or undertake other actions to improve LPC habitat.
- Project funding and coordination for reversing mesquite encroachment in sand shinnery habitat.
- Limited use of herbicide to remove shinnery oak only when certain specified criteria are met.
- Measures to enhance habitat quality in Conservation Reserve Program (CRP) fields including the planting of native grasses.

Funding for all of these strategies may be available through the Environmental Quality Incentives Program (EQIP) and several other existing state and federal programs.

Pathway 2 addresses the loss or fragmentation of habitat that may be a consequence of energy development activities. This pathway presents an innovative set of guidelines for

managing new mineral leasing and development in the PPA, based on sophisticated mapping and habitat analysis. Key recommendations for the PPA include:

- Deferral of new mineral leasing in suitable and occupied habitat, while allowing continued leasing in other areas.
- Coordinated tracking of changing acreages in each habitat category over time.
- Guidelines for lifting lease deferrals in exchange for increases in suitable or occupied habitat, whether due to reclamation efforts or other factors.

Guidelines for protecting occupied habitat in the SSPA and IPA are also presented, as are strategies for minimizing impacts of new mineral development. These include the use of negotiated conditions of approval and plans of development on federal leases, and timing and noise stipulations as needed. Pathway 2 also contains specific recommendations for minimizing surface disturbance and carrying out site reclamation.

Pathway 3 describes various means by which important areas can be maintained and managed as LPC habitat. Principal elements include:

- Consolidation of BLM property in its Roswell CMA, through land exchanges with the New Mexico State Land Office, to help direct future development outside of suitable habitat.
- Recommendations for a comprehensive management plan for the New Mexico Department of Game and Fish-administered Prairie-Chicken Areas.
- Establishment of five new LPC reserve areas, two in the IPA and three in the SSPA. Each would be 4 square miles or larger, on lands purchased from willing sellers or secured long-term lease agreements, or by dedication of public lands.
- Establishment of Candidate Conservation Agreements with Assurances (CCAAs) to encourage conservation efforts on non-federal lands by offering protections from future regulatory requirements.

Pathway 4 focuses on long-term planning for re-establishing LPC populations in the southern portion of the range (the IPA). Strategy elements include:

- Analysis and prioritization of remaining potential habitat areas. Low priority areas would be removed from consideration from special management, while high priority areas may form the building blocks for future reintroduction sites.
- Establishment of a captive breeding and LPC reintroduction program in southeastern New Mexico. A captive propagation facility near Carlsbad would provide a source population for reintroducing birds to unoccupied parts of the historic range, including Department of Energy lands at the Waste Isolation Pilot Project facility.

Pathway 5 presents additional measures for boosting LPC populations by directly targeting specific causes of mortality or low nesting success. Strategies include:

- Limited use of predator control to reduce mortality in isolated lek areas.
- Management and education efforts to reduce poaching and accidental shooting.

- Road closures and other management to limit disturbance by off-road vehicles.
- Limited grain crop plantings for leks in isolated areas with poor habitat quality.

Pathway 6 outlines research and monitoring needs, including specific recommendations for LPC surveys and habitat monitoring. It also discusses criteria by which overall success of conservation efforts may be evaluated. **Pathway 7** discusses strategies for conservation education and outreach. In **Pathway 8**, the group recommends that a position of "Eastern Plains Conservation Coordinator" be established and funded, with responsibilities to coordinate and facilitate the implementation of strategies for the LPC and SDL. This would include working with landowners, seeking to initiate partnership projects, and seeking funding from a variety of sources as described in **Pathway 9.**

Sand Dune Lizard Strategies

Various elements of the LPC conservation pathways apply equally to the SDL, including strategies for education and outreach, coordinating implementation, generating funding, and securing landowner protections through CCAAs. Beyond these, specific conservation recommendations for the SDL include:

- Cessation of herbicide spraying to remove shinnery oak within 500 meters of occupied or suitable SDL habitat;
- Maintenance of dispersal corridors of unsprayed shinnery oak between dune areas less than 2000 meters apart;
- No new oil or gas wells within 100 meters of sand dune areas in suitable or occupied SDL habitat;
- Well density not exceeding 13 per square mile in suitable habitat areas.

Additional recommendations are made for minimizing impacts of existing development, use of "thumper trucks" for seismic exploration, and off-road vehicles.

The final chapter of this document announces closure of the strategic planning efforts of the Working Group, and the formation of an Implementation Team to move collaborative conservation efforts forward into a new phase of operational planning and project implementation. A number of significant conservation actions on behalf of the LPC and SDL are already under way. These represent a significant first step toward reducing threats faced by the two species.

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Chapter One: The Species and the Working Group

1.1 Introduction

This document presents the findings and recommendations of the New Mexico Lesser Prairie-Chicken/Sand Dune Lizard Working Group, a multi-party group of stakeholders with interests in conservation management and land use decisions in southeast New Mexico, regarding two candidate species for federal listing: the Lesser Prairie-Chicken (LPC) and Sand Dune Lizard (SDL). Both species share a strong association with shinnery-oak dominated habitat that marks the southern and western extension of Great Plains grasslands into New Mexico (see Map 1).

The LPC (*Tympanuchus pallidicinctus*) is a North American grouse species once common in native prairie grassland and shrub communities of the southern Great Plains. Throughout the late 19th and 20th centuries, a large percentage of the species' native prairie habitat was converted to agriculture or other uses, resulting in significant declines in LPC numbers and size of occupied range. These historical circumstances laid the foundation from which additional, ongoing reductions in habitat and population size have become matters of species conservation concern. LPC numbers in New Mexico appear to have fluctuated since the 1950s. A population spike occurred in the relatively wet years of the 1980s, followed by a precipitous decline beginning in 1989 and extending through late-1990s, from which the state population has not yet recovered. Parallel declines, over the same time period, have occurred in other states. In 1995, conservation interests petitioned the U.S. Fish and Wildlife Service (FWS) to list the LPC as a threatened species under the Endangered Species Act. In 1998, the FWS ruled that such listing was warranted, but was precluded by the need to devote limited agency resources to other higher priority species (FWS 1998). At that time the LPC joined the list of "candidate" species for federal listing, where it remains today.

The SDL (*Sceloporus arenicolus*) is a lizard species native to a small area of southeast New Mexico and west Texas. A habitat specialist, the SDL only occurs in sandy-soil dune areas dominated by shinnery oak. Such areas are often separated by large stretches of unsuitable and unoccupied habitat. A history of shinnery oak removal and resource development in southeast New Mexico has increased the fragmentation of habitat available to the SDL. This fragmentation, within a small and possibly shrinking geographic range, has led to conservation and management concern over the future of the species. Most knowledge of the SDL has been obtained by research conducted over the past decade, and species status assessment is ongoing. Conservation interests petitioned the FWS to list the SDL as a threatened species under the Endangered Species Act. In 2001, the FWS ruled that such listing was warranted, but was precluded by the need to devote limited agency resources to other higher priority species (FWS 2001). At that time the SDL joined the list of "candidate" species for federal listing, where it remains today.

In addition to prompting actions by conservation groups and the FWS under the Endangered Species Act, LPC and SDL declines have stimulated new research and a search for solutions on the part of state and federal land management agencies, conservationists, and concerned citizens. The New Mexico Department of Game and Fish (NMDGF) completed management plans for the SDL in 1999 and the LPC in New Mexico in 2001. A multi-agency LPC Interstate Working Group was established in 1997, to prepare a range-wide conservation strategy and coordinate efforts among the five states where LPCs are found today. However, because most conservation decisions regarding the LPC are ultimately local land use decisions, a need exists for collaborative planning and negotiation among stakeholders on a scale smaller than that of the entire species range. This is particularly true in sand shinnery areas of New Mexico, where the needs of both the LPC and SDL must be balanced with the concerns of property owners and land users.

Such a collaborative planning process has been under way in southeast New Mexico since early 2003. At issue has been the formulation of a strategy, acceptable to all affected parties and economic interests, for the conservation of the LPC and SDL in portions of the state where one or both species occur, including sections of Quay, De Baca, Curry, Chaves, Roosevelt, Eddy, and Lea counties. The current or recently occupied range of the LPC in New Mexico constitutes the planning area for this document, and includes the occupied range of the SDL (see Map 1). Other areas of historical LPC habitat, in the northeast quadrant of the state, are thought to have been less recently occupied by the species and are not here considered.

Working Group efforts have focused on both the LPC and the SDL simultaneously. In some respects, issues pertaining to the SDL have proven to be less complex, within the negotiating context of the Working Group, than those pertaining to the LPC. This is due in part to the SDL's much more restricted distribution within the planning area, and to its less extensive area and habitat requirements. As a result, material concerning the SDL comprises a smaller percentage of this document than material concerning the LPC. It should be emphasized however that the Working Group views both species with equal concern. The goal has been to create an overall strategy for the conservation of both the LPC and SDL, focusing on the sand shinnery ecosystem on which both species depend.

This document represents the culmination of over two years of negotiation and planning by the New Mexico LPC/SDL Working Group. Its publication marks the end of a process of broad-scale, consensus-based strategic planning for candidate species conservation in southeast New Mexico. This work, however, is only the beginning. The strategies described herein, for conserving both imperiled species and the economic interests of regional land owners and land users, have value only to the extent that they are implemented "on the ground". The mere existence of a plan cannot solve a problem, but it can structure, guide, and encourage efforts to achieve real solutions. Some of the strategies presented here will require further operational and management planning by state and federal agencies. Some will require the formation of active and effective local partnerships between agencies, private landowners, conservation organizations, local governments, and others. Many will require coordinated efforts to secure necessary funding. All of this, amounting to a Phase II of the overall conservation process, is work that lies ahead, or is just now getting under way.

The purpose of this document is to present and describe the Phase I work of strategy planning and negotiation, undertaken by the Working Group between January, 2003 and May 2005. Following this introductory section, Chapter One provides a brief account of the Working Group's formation, mission, and process of negotiation. Chapters Two and Three present more detailed information on land uses and economic values in the planning region, and on the biology of the species including habitat requirements, population status, and potential threats. It also provides background information on existing species management, and regulatory considerations under the Endangered Species Act. All of these factors together determine the necessities and constraints of conservation planning in the state.

The Working Group's conservation strategy for the LPC is presented in Chapter Four. Introductory sections to that chapter describe goals and priorities for the conservation strategy, and the structure by which it is organized. The strategy consists of many different elements, which collectively address all of the biological needs and threats described in Chapter Three. Some of these elements apply to both the LPC and the SDL. Specific conservation recommendations for the SDL are presented in Chapter Five. Chapter Six summarizes what is already being done to carry out different elements of the conservation strategy, and points the way to the Phase II process of operational planning and project action.

It may be noted that in some respects this document structure differs from that of most other conservation plans or strategies, as often developed within an agency context. This difference is a reflection of the document's origins in a multi-party stakeholder group, working under tight time constraints as described below, and of its broadly strategic intent.

1.2 Formation and membership of the Working Group

In December, 2002, representatives of NMDGF, FWS, the Federal Bureau of Land Management (BLM), the New Mexico State Land Office (NMSLO), and the Wildlife Management Institute proposed that a "Working Group" of appropriate public and private stakeholders begin meeting to devise a conservation strategy for the LPC and SDL. The organizers hoped the various constituencies would be able to negotiate a collaborative plan that would, when implemented, improve the status of the species such that federal listing would no longer be warranted, while protecting the interests of the participating parties. In January, 2003, organizers hired a professional facilitator to begin guiding the process of Working Group formation. The first task was to identify potential stakeholders with an interest in the conservation of the two species, or in any recommendations or policy decisions regarding land use within the planning area of southeast and east-central New Mexico. To accomplish this, the organizing committee proposed carrying out a "situation assessment," followed by an initial meeting at which a collaborative planning process would be established and individual representatives to the Working Group would be identified.

The situation assessment, conducted in January, 2003, consisted of facilitator interviews with 20-25 key individuals from potential stakeholder groups, along with analysis of the interview findings and preparation of a tentative set of ground rules and an agenda for the initial Working Group meeting. These interviews helped the facilitation team understand the central issues and concerns of different stakeholder groups, and also helped the organizers identify additional

individuals who might be important to the process. The interviews revealed a strong interest in a Working Group process that could be completed quickly, in nine months or less. Accordingly, a framework for a six to nine-month planning process was drawn up, for review and ratification at the initial stakeholder meeting.

Individuals from all stakeholder groups and concerned citizens were invited to the first meeting of the "Southeast New Mexico LPC/SDL Working Group", held in Roswell, NM in February, 2003. About 80 people attended. Participants agreed that criteria for participation in the Working Group should include the ability to communicate clearly, a willingness to negotiate, the capacity to participate in regular monthly meetings until completion of the process, and a willingness to represent and communicate with others in their respective constituency group. It was also agreed that there should be adequate representation of all principal administrative, economic, and conservation constituencies, with participants who could bring technical expertise and local knowledge from different geographic areas within the planning region. Through a process of self-selection and recruitment, the Working Group was officially established with representatives from the following six constituencies:

State and Federal Agencies

- Bureau of Land Management (BLM)
- U.S. Fish and Wildlife Service (FWS)
- Natural Resource Conservation Service (NRCS)
- U.S. Department of Energy (DOE)
- New Mexico Department of Game and Fish (NMDGF)
- New Mexico State Land Office (NMSLO)
- New Mexico Department of Agriculture (NMDA)

Oil and Gas Industry

- Independent petroleum producers
- Large corporate producers
- Associations (Independent Petroleum Association of NM; NM Oil and Gas Association)

Ranching Industry

- Private land operators
- Federal and state permittees

Conservation Interests

- Audubon Society
- The Nature Conservancy (TNC)
- Quivira Coalition
- Wildlife Management Institute (WMI)
- Theodore Roosevelt Conservation Partnership (TRCP)
- Individual conservation biologists

Sportsmen and recreational interests

County and municipal governments

Participants also designated three committees to assist in the planning process. A Coordinating Committee was established to work with facilitators in scheduling meetings, setting agendas, and

distributing materials to the group. This was composed of the original agency organizers plus representatives from the ranching and oil and gas industries. A Technical Committee was established to gather relevant data, consult with outside experts as needed, provide scientific review of the biological status and threats to the species, and comment on potential conservation strategies. This committee included biologists associated with the FWS, BLM, and the University of New Mexico, and independent contract scientists. Finally, a Document Committee was set up to guide the drafting of a broad strategy document based on information and decisions from the Working Group meetings. (Subsequently, at the request of the Document Committee, a professional writer was hired to participate in meetings and draft document text.) Membership of the Working Group and the various committees is presented in Appendix B.

1.3 Goal statement of the Working Group

The initial stakeholder meeting led to the adoption of a mission statement for the Working Group. In its original form this addressed only management strategies for the shinnery oak vegetative community inhabited by the LPC and, across a much narrower range, the SDL. The statement was later modified slightly to encompass the full range of LPC habitats in New Mexico.

> **The goal statement of the Working Group is:**
> *To create a conservation strategy for the management of shinnery oak and sand sage – grassland communities in southeastern and east-central New Mexico, recommending a range of specific actions to enhance and secure populations of Lesser Prairie-Chickens and Sand Dune Lizards, so that federal or state listing of these species is not needed, while protecting other uses of the land.*

1.4 Working Group principles and philosophy

The stakeholder process is based on the idea that the most enduring decisions are made at the local level, through negotiated agreement among all affected parties. Collaborative problem-solving of this kind is often most effective when participants are encouraged to think beyond existing or perceived regulatory, technical, or political constraints. At the same time, however, innovation must be balanced by realistic assessment of what is or is not possible. The Working Group's approach has been to seek consensus around a set of broad-based but practical strategies, with an understanding that further work in developing operational mechanisms and processes must be carried out within the context of specific agency plans and local conservation partnership efforts.

At the outset, participants agreed to the following basic set of operating principles and ground rules for the process:

- No agency, group or individual would give up legal rights, or the option of seeking future legal remedies, by virtue of participation in the Working Group; however, participants agreed that litigation or other regulatory intervention could jeopardize the process.
- The Working Group as a whole would be responsible for the overall conduct and outcome of the negotiation and planning effort.

- Participants would respect one another's personal integrity and values.
- Members would honor all commitments made during negotiation, with the exception of previous commitments rendered unnecessary or invalid by subsequent strategy revisions or modifications agreed to by the group.
- Members would participate in good faith throughout the process, and keep their respective constituencies informed about current and upcoming issues, discussions and decisions.
- Decisions and recommendations would be based on consensus of all Working Group members. Given a failure to reach consensus on a particular issue, dissenting views would be clearly noted in the strategy document.
- Meetings would be open to the public and time would be set aside as necessary for public comment.
- Audio and/or visual recording of meetings would not take place without prior permission.

1.5 History and process of negotiation

Following the initial February 2003 meeting, the group met monthly through October, 2003. At that time—roughly the end of the originally envisioned six to nine months—substantial work remained in reaching consensus around a number of issues. The group agreed to break for the winter, and resumed meeting in March 2004. Work continued throughout 2004, much of it in the context of smaller sub-committees and constituency groups tasked with resolving specific issues. Early in 2005 this work was presented to and further refined by the larger Working Group.

At the outset the facilitation team proposed—and the group adopted—a five-stage planning process designed to move the group expeditiously from developing a common understanding of the issues to adopting an overall conservation strategy. During the first stage, following the adoption of ground rules and a mission statement, participants exchanged written materials and heard presentations by other group members and outside experts, in order to develop a shared understanding of biological, regulatory, and economic issues and constraints. In the second stage, the group worked to condense this background information into a tabular listing of all potential threats to the species, and potential conservation solutions in the form of general or specific management practices that could be undertaken by agencies and/or land users. During this period the relative importance of various possible solutions, as part of an overall conservation strategy, began to be debated.

In stage three, recognizing that threats and solutions varied in conservation importance from region to region, participants worked for two months in geographic sub-groups, to focus on specific projects and management approaches that would be most suitable for different areas. In the fourth stage, the group returned to consideration of broad management standards and practices, with input and recommendations from the Technical Committee. During stages three and four the Document Committee began to consider how the various recognized threats, specific place-based or project-based solutions, and general management guidelines might best be addressed and organized in a strategy document. A document outline and substantial sections of draft text for the "Conservation Strategy" chapters were produced.

The fifth and longest part of the process—extending from October, 2003 to May, 2005—consisted of reviewing and refining strategy proposals around which the group was able to reach general agreement, and seeking to reach compromise solutions in areas that have been more controversial. Progress in formulating and building consensus around more controversial issues continued in a series of stakeholder constituency group meetings in the fall of 2004 and subsequent technical work by subcommittees. A complete initial draft of this document was completed in January 2005 and submitted for Working Group review and approval. Final approval of the LPC and SDL strategy chapters was obtained in February, 2005, and approval of the complete document was given in a concluding Working Group meeting in May 2005.

Chapter Two: The Planning Area

2.1 The ecological context: shinnery oak and sand sage grasslands of southeastern New Mexico

Sand shinnery communities extend across the southern Great Plains, occupying sandy soils in portions of north and west Texas, west Oklahoma, and southeast New Mexico. Estimates of acreage in New Mexico vary, from 1.5 million acres (Peterson and Boyd 1998) to 2.6 million acres (Garrison and McDaniel 1982). The Bureau of Land Management (BLM) estimates that between 400,000 and one million acres of sand shinnery occur on public lands in the state. Some historical areas of sand shinnery have been converted to other cover types, and over 100,000 acres have been treated with herbicide in order to encourage forage production for livestock (Peterson and Boyd 1998). Portions of the LPC range, particularly in Chaves, Roosevelt, Eddy and Lea counties, consist largely or entirely of sand shinnery habitat (see Maps 1 and 2).

The characteristic feature of these communities is co-dominance by shinnery oak (*Quercus havardii*) and various species of grasses. Shinnery oak "forests" consist of massive underground stem systems, with visible shrubs of only one to four feet in height. Under favorable conditions, native tallgrass species may grow higher than the oak shrub layer. In New Mexico shinnery occurs in sandy soil areas, often including dunes. Two midgrass species, little bluestem and sand dropseed, are common throughout. Tallgrass species, particularly in sand dune areas, include sand bluestem, big bluestem, switchgrass and giant dropseed. Various other midgrass and shortgrass species may be present in different sand shinnery associations. In regularly grazed systems there is often a shift away from perennial grass species (bluestems, switchgrass, side-oats gramma, giant dropseed) towards a greater abundance of annual forbs and grasses (sandbur, purple sandgrass, fringed signalgrass, false buffalograss) and a different mix of perennial grasses. Additional shrub species that may be present in the sand shinnery include sand sagebrush, broom snakeweed, four-wing saltbush, and mesquite (Peterson and Boyd 1998, Dick-Peddie 1993).

In south Roosevelt and north Lea counties, an important habitat area for LPCs, Ahlborn (1980) described three distinct community types within the sand shinnery: 1) shinnery oak / sand bluestem or little bluestem associations, indicative of high quality range condition; 2) shinnery oak / midgrass associations, including various grama, dropseed, and three-awn species, indicative of poor to fair range condition; and 3) sandhill areas dominated by shinnery oak with few grasses. Martin (1990) recognized 8 distinct sand shinnery communities in southeast New Mexico, distinguished primarily by different combinations of bluestem, purple three-awn, sand dropseed, hairy gramma, witchgrass, and yucca species.

Shinnery oak is adapted to life in a generally arid climate, with considerable variation in precipitation. It may absorb and store water when available, and may shed its leaves or not leaf out in the spring during times of drought. Thus periods of water shortage are generally more severe on grasses in the sand shinnery than on the oak. Although in most years shinnery oak produces acorns (at times an important food source for LPCs) most reproduction occurs by vegetative cloning. Individual shinnery oak plants grow slowly and live for hundreds of years, and pollen analysis shows that the species have been dominant in its community over the last

3,000 years. Unlike other shrubs, shinnery oak does not spread rapidly into grassland areas when grass cover declines. However, high stocking densities of cattle may effectively transform some areas from grass-shrub co-dominance to systems dominated by shinnery oak. The extent to which shinnery oak cover may impede grass growth has received considerable debate. In southeast New Mexico Davis et al. (1979) found that oak and grass densities were positively correlated with one another: the more oak, the more grass. Other studies have found that grass growth may be impeded in dense shinnery oak stands, and this has led to the controversial practice of applying herbicides to the oak in order to increase forage production (Peterson and Boyd 1998). This issue is further addressed in Chapter Three.

Various bird, mammal, reptile and invertebrate species inhabit the sand shinnery ecosystem in New Mexico. Herbivorous mammals include mule deer, white-tailed deer, pronghorn, and up to 16 rodent species. Carnivores include coyote, bobcat, badger, striped skunk, and swift fox. In addition to the LPC, two upland game bird species, scaled quail and mourning dove, are present throughout the sand shinnery in New Mexico. About 20 species of songbirds nest commonly, with a much larger number that use the habitat during migration or for non-nesting activities. Common avian predators include northern harrier, Swainson's hawk, red-tailed hawk, kestrel, burrowing owl, and Chihuahuan raven. About 25 snake and 10 lizard species have been recorded, including the SDL, the only vertebrate species restricted entirely to sand shinnery habitat.

North and east of the sand shinnery, in parts of Quay, De Baca, Curry and Roosevelt counties, LPCs occur in a second major habitat type, characterized as sand sage - grassland. Sand sagebrush (*Artemisia filifolia*) is present to a moderate degree within the sand shinnery itself, but replaces shinnery oak as the dominant shrub species in sand scrub habitats of east-central and northeast New Mexico (Dick-Peddie 1993). Sand sagebrush is the dominant shrub species in other portions of the LPC's range outside of New Mexico. Additional information on LPC and SDL habitat requirements is provided in Chapter 3.

2.2 The economic context: ranching interests

Ranching is the predominant land use in sand shinnery habitat in New Mexico. Ranchers throughout the planning area have longstanding ties to the land, and many occupy properties passed down from generation to generation. Livestock grazing contributes significantly to the economies of the mostly rural counties in the planning area. Beyond this, ranching is valued as a tradition and a way of life.

Although ranching is considered an economic and cultural mainstay across the region, a variety of pressures—including drought, changing land uses, and the fluctuating price of beef—make the economics of individual ranching operations precarious at times. Area ranchers tend to be wary of new restrictions or regulations that may affect how they do business, and for this reason have expressed a strong interest in avoiding the need for federal listing of any species in their region. As discussed in later sections, ranching can work in the interests of species conservation, and successful ranching operations help protect rangeland habitat from being converted to other land uses. The Working Group has tried to find strategies and solutions that can be supported by the ranching community, and that would not result in unfair economic impacts.

Special consideration must be given to the checkerboard nature of surface ownership in much of the planning area (see Map 2). While some ranching operations are carried out entirely on private lands, most utilize a mixture of private land and federal and/or state lease allotments. In these cases, the income potential for the entire ranch is dependent upon the permitted level of use—specified in animal units—as set according to the terms of the lease agreement.

Management agencies may sometimes adjust allowable grazing levels in response to changing range conditions, and operators may chose to graze their lease allotments below permitted levels to improve grass cover, particularly in times of drought. However, reductions in numbers of cattle grazed cut into earning potential, without a corresponding reduction in costs. The loss or severe restriction of a grazing permit may result in an entire operation becoming no longer viable. In addition, loss or restriction of usage rights on public land will decrease property values. It is important to understand that grazing leases have real economic value—separate from and in addition to the value of the private property with which they are associated—and are subject to inheritance tax. Thus the loss of a lease will negatively affect both the earning potential and the overall value of a ranching operation.

The Working Group has made strategy recommendations for rangeland management practices that will benefit LPCs, coupled with economic compensation for ranchers whose earnings may be affected by the voluntary implementation of these strategies. The group has also identified a need for protection from future regulatory burdens on private landowners in the event of listing. See Chapter 4, "Pre-requisites for implementation" and Conservation Strategies 1.1 and 3.4.

2.3 The economic context: oil and natural gas interests

The planning area of southeastern and east-central New Mexico is also one of the major petroleum-producing regions of the United States, drawing on the oil and natural gas resources of the Permian Basin, Delaware Basin, and Pecos Slope. Development of oil resources in this area dates back to the 1920s. While the region has been subject to cycles of increased and decreased productivity over the years, as different resource strata have played out and oil markets have fluctuated, the industry has remained vital due to ongoing world energy demand and the development of new technologies and methods of extraction. New Mexico currently ranks in the top five states for on-shore oil and natural gas production.

Oil and natural gas producers, and the companies that service and supply them, have for decades been central drivers of the economies of counties in the planning area, and of the state. In southeast New Mexico, roughly 10,000 people are directly employed in oil and natural gas extraction, and over 23,000 are employed in related occupations. Lea, Eddy, and Chaves counties are the largest producers with the greatest dependence on oil and natural gas for jobs and revenues. Much of the economic well-being of these mostly rural counties is tied to royalties generated by petroleum production and the taxes this production generates. Wages in the industry are relatively high, and exceed the state average wage. Employers include both producers and service companies, and range from large companies headquartered out of state to hundreds of small, independent operators. Extraction employment has declined from previous high levels, and efforts are under way to diversify the economic base in the region. However,

lost jobs in the oil and natural gas industry are not easily replaced by comparably high-wage jobs in other fields.

In addition to their local contributions, petroleum producers in southeast New Mexico make significant contributions to state revenues, through taxes, royalties, rent and lease fees, and mining tax fund interest payments. Oil and gas contributes 20-25% of the state's General Fund revenues annually. Over 90% of state lands revenue is generated by oil and gas activity on state trust lands. The Land Grant Permanent Fund, administered by the State Land Office, generates investment returns on royalties from oil and gas production, which are used to fund public education throughout the state. New Mexico also receives a percentage of mineral leases paid to the federal government for resource extraction on federally-owned public lands. Factors that may restrict or preclude full development of state and federal lands will thus affect the flow of revenues into local and state economies.

To understand how land management decisions made in the interest of conservation may impact the oil and gas industry, it is useful to understand the broad sequence of events by which development typically proceeds. Royalty revenues are generated both at the time of leasing and during active production. From an industry perspective, it is important to note that state and/or federal regulations, and the ensuing need for added economic expenditures by producers, are present at each stage in the process. Abrupt changes in regulations, and delays caused by regulatory compliance, can be highly disruptive to producers in planning for and carrying out the long-term, capital-intensive process of lease acquisition and development. In brief outline, the normal steps in this process include the following.

1. Leasing. A potential producer must acquire the right to develop an oil or natural gas reserve, by contractual agreement with the mineral owner. This is often either the state of New Mexico or the federal government.

2. Exploration. Having acquired a lease, the producer carries out geologic and seismic studies to locate optimal sites. Well location and right-of-way easements must then be negotiated with surface owners.

3. Permitting. Before production can begin, operators must obtain permits for their proposed development. In this process, environmental, archaeological, and other surface issues are addressed. Many state and federal regulations guide the permitting process. The well spacing (number of wells per section) allowed for any mineral formation is determined by the New Mexico Oil Conservation Division (NMOCD).

4. Drilling, casing, and well production. Drilling is usually done by a drilling contractor, working around the clock until the process is completed. The drilled hole is sealed with cement and steel casing to prevent fluids from migrating. Well construction begins after drilling and casing is finished.

5. Active production. When all construction tasks have been completed, the site becomes operational and production begins. A given well may remain active for a period of years to decades.

6. Reclamation. After drilling, any disturbed area not needed for production operations must be reclaimed by returning it to as close to its original condition as possible. Operators must dispose of drilling waste materials, fill pits and holes, and remove compaction from the soil. Restoration and revegetation requirements must also be met, as determined by the lease agreement.

7. Plugging and Abandonment. After all recoverable resources have been drained from a site, the well is plugged and abandoned. Final reclamation includes the removal of all production equipment and wastes, closing of access roads, and revegetation.

2.4 Land ownership and use

Most of land within the planning area falls into one of three categories: privately owned lands, New Mexico state trust lands, and federal public lands managed by the BLM. (There are some exceptions, such as federal lands managed by the DOE in Eddy County, and the state-owned Prairie-Chicken Areas (PCAs) managed by NMDGF.) The overall pattern of land surface ownership in the area of LPC and SDL distribution is shown in Map 2. The entire planning area includes approximately 1,182,930 acres of BLM lands, 1,008,250 acres of state trust lands, 3,787,460 acres of private lands, and 39,330 acres in other ownership categories.

As can be seen in Maps 2 and 3, surface ownership patterns are not evenly distributed across the planning area. Federal holdings are more extensive in the south, while state and private lands dominate in the north. The Working Group's conservation strategy for the LPC recognizes a division of the planning area into three regions, based on differences in LPC population status (see section 3.1), and these vary greatly in surface ownership. A southern "Isolated Population Area" mostly in Lea and Eddy counties includes 884,630 acres of BLM lands, 437,500 acres of state trust lands, 528,830 acres of private lands, and 10,250 acres of other ownership. A central "Primary Population Area" in east Chaves, north Lea, and south Roosevelt counties includes 75,410 acres of BLM lands (including 56,620 acres within the Roswell Core Management Area), 216,220 acres of state trust lands, and 632,610 acres of private lands. Farther north, a "Sparse and Scattered Population Area" includes 222,870 acres of BLM lands (including 66,000 acres of the Roswell Core Management Area), 354,290 acres of state trust lands, 2,625,690 acres of private lands, and 29,080 acres of other ownership.

In many areas, land surface and subsurface mineral rights are owned by two different parties, adding complexity to the overall pattern of land use and management. For example, although Map 3 shows little BLM surface ownership in the eastern half of the LPC Primary Population Area, mineral rights over an extensive portion of this region are federally-owned and leased. Overall the BLM administers approximately 1,989,750 acres of subsurface minerals across the planning region. The NMSLO administers an additional 1,250,150 acres of subsurface minerals.

Chapter Three: Species Biological Background and Conservation Status

3.1 LPC distribution and status

Historical records indicate that the Lesser Prairie-Chicken (LPC) was once distributed over large areas of suitable habitat within the five states where remnant populations survive today: Colorado, Kansas, New Mexico, Oklahoma, and Texas. Total LPC population size and distribution have declined substantially since the early 1800s, including a 78 percent reduction in size of occupied range since 1963 (Crawford 1980, Taylor and Guthery 1980). Thus today's relatively small and isolated populations represent an enormous change from historical conditions. Outside of New Mexico, LPC populations exist today in southeastern Colorado and southwestern Kansas, western Oklahoma and the Texas panhandle.

In New Mexico, the LPC historically occupied sandhill country of the eastern plains, including sand sage - bluestem communities in the northeast and east-central parts of the state, and shinnery oak - bluestem communities in the southeast (Ligon 1961). Ligon (1927) produced a map of the historical range of the species, which included parts of 12 counties in eastern New Mexico from the Colorado border in the north to the Texas border in the south. Currently the LPC is absent or near extirpation from 56 percent of its historical range in the state (Bailey and Williams 2000). It has not been observed in the northeastern portion of the state (north of Interstate 40) since 1993 (Smith et al. 1998).

Bailey and Williams (2000) divided the LPC range in New Mexico into three categories, based on population status, and an updated version of that scheme has been adopted for this plan (see Maps 2 and 3). Within the planning unit of east-central and southeast New Mexico, ***isolated*** population areas occur in east Eddy and south Lea counties, north from the Texas border to 33 degrees latitude. These are described as areas where LPC populations are extirpated, or nearly so. At present a single known lek exists in south Lea County, though LPCs have been sighted in other areas and the existence of additional leks is suspected. ***Scattered*** populations occur in two areas: southeast Chaves county south of Highway 380, and areas north of 34 degrees latitude, primarily in north Roosevelt and Curry counties but also including small portions of east De Baca and south Quay counties. ***Well-distributed*** or core populations exist in roughly 16 percent of the historical range, north of Highway 380 and south of 34 degrees latitude in north Lea, south Roosevelt and northeast Chaves counties.

It is likely that LPC populations in New Mexico have experienced significant fluctuations over much of the 20th century. While formal survey data are lacking, anecdotal accounts from biologists, game managers and land users indicate that restriction of at least the majority of the New Mexico LPC population to the central portion of the range may have occurred during drought periods of the early 1930s and early 1950s (Ligon 1953, Massey 2001). Greater abundance and more widespread distributions were reported in the late 1950s and early 1960s, and again in the 1980s (Snyder 1967, Massey 2001). The current status of the LPC in New Mexico is the result of a significant decline beginning after the population increases of the 1980s.

Similar declines in other states—particularly Oklahoma and Texas—resulted in a finding by U.S. Fish and Wildlife Service (FWS) in 1998 that the LPC was warranted for listing under the Endangered Species Act. This listing was precluded by other higher priority actions and the chicken was placed on the FWS candidate species list.

While it is impossible to conduct a complete and accurate census of LPC numbers, biologists can monitor population trends by several methods, including roadside surveys, counts of males seen per lek, and surveys of lek density in a given area. Bureau of Land Management (BLM) survey data for the Caprock Wildlife Area in Chaves and Roosevelt counties showed increases through the mid to late 1980s, followed by an abrupt decline in 1989 (Johnson and Smith 1999). Increased survey effort through the 1990s continued to record an average of 110 LPCs per year, far below the peak of 1400 birds in 1986. Similar declines were documented by surveys in west-central Lea County, where LPCs went from a peak of 160 birds at 20 lek sites in 1987 to only two birds at one lek site in 2000 (Bailey and Williams 2000; see Map 2). In 1998 only 1 of 29 historic leks in Eddy and southern Lea counties was found to be active, and no new leks were detected on 244 miles of roadside surveys (Massey 2001). Since that time surveys and casual sightings in this region have documented a few individual birds but no new active leks.

For the past eight years the New Mexico Department of Game and Fish (NMDGF) has conducted roadside surveys to identify active leks on public and private lands in "core" and "sparse and scattered" portions of the occupied range. The total number of leks detected has remained generally stable since 1999. NMDGF also conducts surveys on 29 designated Prairie-Chicken management areas (PCAs) and some adjacent private lands in northern Lea and southern Roosevelt counties. These surveys have documented an increase in LPC leks, and in numbers of birds observed since 1996, possibly indicating a reversal of the downward trends of the early 1990s in areas where the species receives management protection (Davis 2003).

3.2 LPC species ecology, life history and population dynamics

Understanding and responding to the causes of LPC declines requires consideration of both the biological needs of the species and changes to its habitat. Important characteristics of the LPC, from a conservation perspective, stem from the bird's unique physical and behavioral adaptations to southern Great Plains shrublands, and from the biological legacy it shares with other prairie grouse species of North America. Like other grouse, the LPC is a relatively short-lived bird whose life history is characterized by high reproductive potential (10-14 eggs per clutch) counterbalanced by high rates of mortality, most commonly by predation on eggs, chicks, or adults (Giesen 1998, Bidwell et al. 2001).

Results from a number of studies indicate that most LPC nests fail due to egg predation or abandonment, before chicks are hatched (Giessen 1998). Additional mortality of chicks prior to fledging, and of broods after leaving the nest, further limits recruitment into the adult population. Total first-year mortality (prior to reproductive age) of LPCs may exceed 65%, and annual adult mortality is over 50% (Campbell 1972, Giessen 1998). As a result, while only a small fraction of LPCs survive from egg to adulthood, complete turnover of individuals in a population may occur in less than five years. Adult mortality is greatest during the spring months when LPCs are

engaged in display, dispersal and nesting activities (Wolfe et. al 2003, Wolfe and Patten 2003; see Threats to the LPC in New Mexico, below).

LPC populations are sustained by each year's small percentage of successful nests, and smaller percentage of surviving chicks. Environmental factors that affect rates of nest success and chick survival in a given year, or over a series of years, thus exert a strong influence on populations and may bring about fairly rapid swings in numbers. In the closely related Greater Prairie-Chicken, nest success and brood survival have been determined to be the primary factors driving population trends (Wisdom and Mills 1997). The same is likely true for the LPC and other prairie grouse species (Bergerud 1988, Giesen 1998, Applegate and Riley 1998, Bidwell et al. 2001). The potential of local LPC populations to respond to changes that may increase or decrease nest success and recruitment is a key consideration for the conservation of the species.

As is the case for other prairie grouse, LPC life revolves around the mating display areas known as gobbling grounds or lek sites. These are typically situated in open, slightly elevated areas with minimal vegetation. Males gather at lek sites, in groups of 10-20 or more, for several months during the spring breeding season, and often again in the fall. Females attend the leks for shorter periods, typically from late March to May, and it is at these times that display activity is greatest. At each lek site males defend small territories and try to attract females through gobbling competitions and ritualized displays. After mating occurs, hens select nest sites in appropriate habitat away from the lek site (see Habitat Requirements below). Laying the complete clutch of eggs takes up to two weeks, and is followed by 24-26 days of incubation. Eggs and incubating hens are highly vulnerable for this 40-day period, which typically extends through May and early June. Chicks leave the nest within a day of hatching, but remain in the care of their mothers for up to 12 weeks before dispersing into the general population. Juvenile males attend established leks in the fall, and young females breed for the first time the following spring (Giessen 1998, Bidwell et al. 2001).

Leks can only exist where the various habitat elements required for displaying, nesting, brood-rearing, and winter feeding can all be found in fairly close proximity (see Habitat Requirements below). Leks usually occur in clusters, in areas of suitable habitat, and multiple leks are required to maintain a viable population (Bidwell et al. 2001). The size (number of males) of a given lek typically varies over time with habitat quality and population density. New leks are most likely to become established during periods of population expansion. Established leks may be abandoned due to disturbance, reduction in habitat quality or local population decline. Male fidelity to existing lek sites, and the social nature of the species, make the establishment of new leks a relatively infrequent occurrence, and this may constrain the rate at which LPC populations may occupy or reoccupy areas of suitable habitat.

The diet of LPCs in New Mexico's shinnery oak - grassland community has been studied in detail, and shows considerable variation throughout the year. In the spring, LPCs feed primarily on green vegetation (leaves and flowers) and, to a lesser extent, on seeds. The summer diet of adult birds consists of about one half insects (mainly grasshoppers and treehoppers), one quarter vegetative material, and one quarter seeds; juveniles feed almost entirely on insects (Davis et al. 1980). In the fall and winter, LPCs may rely heavily on shinnery oak acorns for the majority of their food supply. Seeds and leafy vegetation remain a part of the diet and may be relied upon in

years when no acorns are produced (Riley et al. 1993), and are important in sand sage - grassland habitats.

Grain fields are also used for winter foraging in areas where cultivated lands occur in the vicinity of rangelands. The importance of grain crops in helping maintain LPC populations through times of food scarcity is not known. Bidwell et al. (2001) note that food is generally not a limiting factor for upland game birds such as the LPC. They go on to say however that food plots may sometimes benefit small populations in fragmented habitats.

LPCs occasionally use surface water where it is available, typically from stock ponds. However the species evolved in an environment frequently devoid of standing water, and has the ability to meet its water requirements solely through the consumption of vegetation and insects (Giessen 1998). It is not known if the availability of surface water increases survival during drought periods, when food availability and water content may be low.

3.3 LPC habitat requirements

A combination of local habitat and landscape features is required to meet the needs of the LPC throughout its annual cycle, and to sustain populations over longer intervals. Areas of potential habitat may fail to meet species needs if one critical element is missing; conversely, superior habitat in which all elements are present may fail to conserve the species if it exists only as a series of "islands" too small to host viable breeding populations, and too isolated for dispersal to occur. In broad terms, LPC habitat consists of native grassland and shrubland adapted to a disturbance regime that includes grazing by large herbivores (Bidwell et al. 2001). Suitable habitat contains both early and late stages of plant succession, including open areas with sparse vegetation, native annual forbs, perennial native tallgrasses and forbs, and native shrubs (Bidwell et al. 2001). Different land uses, and the presence of non-native plant species, may greatly affect the frequency and magnitude of disturbance and the patterns of succession that occur. In southeastern New Mexico, LPC habitat occurs in sand shinnery communities dominated by shinnery oak and several species of bluestem, grama, and dropseed grasses. In ungrazed or lightly grazed areas, native tallgrass species such as sand bluestem may grow higher than the relatively low (1-3 ft.) shinnery oak canopy. In east-central New Mexico, where shinnery oak does not occur, the shrub component of LPC habitat consists largely of sand sagebrush.

3.31 Lek sites

Open "gobbling grounds" for display and mating are an important part of LPC habitat. LPC lek sites are typically established on small, elevated areas with bare soils or very sparse vegetation. Suitable conditions for lek sites exist where there is a high degree of surface disturbance, including heavily grazed areas, prairie dog towns, old roads, abandoned oil and gas well pads, and herbicide treatments. In New Mexico there is no shortage of potential lek areas; however, certain types of human-caused disturbance may interfere with courtship and mating activities, and cause the abandonment of lek sites. (See discussion under Threats below).

3.32 Nesting Habitat

The supply of safe nest sites is thought to be a primary factor limiting populations of prairie grouse, including the LPC. A common finding of studies in New Mexico and elsewhere is the importance of tallgrass cover for nest success. In shinnery oak and sand sage - grassland communities, such cover is provided by perennial bunch grasses. Nesting habitat for LPCs is subject to an important ecological constraint that arises due to the timing of the annual breeding period. Because LPCs nest early in the growing season, residual tallgrass vegetation from the previous year is needed to provide nesting cover (Davis et. al 1979, Riley et. al 1992).

Nests are most often located in sandhill areas, on north-facing slopes for protection from direct sun and prevailing winds. Studies in Chaves County have shown that over large areas containing multiple types of vegetation, LPCs exhibit strong preferences for nesting in shinnery oak - tallgrass habitat in general, for patches containing the most sand bluestem in the 10-foot diameter area around the nest, and for sand bluestem clumps as nesting cover. LPCs avoid nesting in mesquite and shortgrass-dominated areas where sand bluestem is absent (Davis et. al 1979). Bluestem grasses grow in clumps that are taller and denser than surrounding vegetation, providing greater concealment both from the air and at ground level. In Oklahoma, vegetation at nests was about five times higher and three to five times denser than at random points (Wolfe et. al 2003).

LPC preference for tall grassy vegetation is almost certainly due to the greater protection it provides. In Chaves County, nests placed in habitat areas in which sand bluestem was the dominant grass species were three times more likely to succeed than those placed in other habitat types. Within bluestem-dominated habitat, nests placed directly in sand bluestem clumps were significantly more successful than those placed in other types of vegetation. Average bluestem height was 26 inches at successful nests versus 14 inches for unsuccessful nests (Davis et al. 1979). Several reports have recommended a grass height standard of roughly 18-20 inches for nesting habitat (Wildlife Habitat Management Institute 1999, Bidwell et al. 2001, Jamison et al. 2002). Density of vegetation at the nest site and width of bluestem clumps also play a role in determining nest success (Riley et al. 1992, Giesen 1998). Tallgrass growing in dense clumps 3-10 feet in diameter may be optimal (Wildlife Habitat Management Institute 1999).

While tallgrasses are crucial for nesting cover, shrub cover is also a necessary component of good nesting habitat in New Mexico. Where present, shinnery oak may provide a vital part of the LPC's annual food supply, and is important for shade and escape cover. Successful nests in Chaves County were located in patches in which the vegetation was roughly 65% grasses and 30% shinnery oak. More generally, Bidwell et al. (2001) recommend the maintenance of at least 20% low shrub cover. Vegetation of the appropriate size and composition for successful LPC nesting develops at an advanced stage of plant succession. It occurs in areas with a relatively light or patchy disturbance regime. Heavy disturbance that prevents the establishment of perennial tallgrass cover over large areas tends to result in habitat that is unsuitable for LPC nesting.

3.33 Brood-rearing habitat

Habitat for chick foraging and brood rearing occurs within the same shinnery oak - grassland and sand sage - grassland vegetation types as nesting habitat, but may differ somewhat

in composition and structure. Young LPCs leave the nest soon after hatching, and hens may lead their broods far from the nest site in search of food. Brood rearing habitat typically contains more bare ground (roughly 60%) than nest areas, with more forbs, less grass cover, and lower grass height. (Applegate and Riley 1998). Thus, brood-rearing habitat represents an earlier stage of plant succession than that used for nesting, and may be present in more frequently disturbed areas.

Forbs and shrubs are important for brood-rearing because they support the insects that constitute the primary diet of LPC chicks. Forb cover in particular has been associated with higher levels of insect abundance (Jamison et al. 2002). Leafhoppers, an important food of LPC chicks, are associated with shinnery oak. Bare ground areas are used for locating seeds and capturing insects. A shrub component is important for shade and cover. Surface disturbances such as fire can increase the amount of weedy and open areas associated with quality brood-rearing habitat (Boyd and Bidwell 2001). Optimal vegetative cover for brood-rearing has been characterized as 20% forbs, 40% grasses and 40% shrubs (Davis et al. 1980, Applegate and Riley 1998).

3.34 Fall and winter habitat

LPCs typically range across larger areas during the fall and winter months, occupying the same general types of habitat as are used for nesting and brood-rearing. Habitat use depends largely on the availability of food resources, particularly seeds, shinnery oak acorns, and green vegetation. Grain fields may be used for foraging if they are located adjacent to habitat that provides adequate cover for resting and concealment.

3.35 Area requirements for populations

Ultimately the survival of populations depends on the number and size of leks a particular region can support, and on the degree to which the regional landscape allows for the dispersal of birds from one population unit to another. Bidwell et al. (2001) note that the combined home ranges of all birds at a lek may exceed 12,000 acres, or 19 square miles. This includes a central 2-4 square mile core of prime nesting and brood-rearing habitat, and a larger surrounding area for year-round foraging. For a LPC population to remain viable even in the short term, breeding must take place across a series or complex of leks. Bidwell et al. (2001) state that 25,000 acres of "contiguous high-quality native rangeland" may be the minimum land area required to maintain a healthy and sustainable LPC population.

Applegate and Riley (1998) recommend clusters of 6-10 or more leks, each with a minimum of six males, separated from one another by a distance of 1.2 miles or less. A number of studies have reported inter-lek distances of a mile or less (Jamison et al. 2002). At such densities, a complex of 6-10 lek sites could fall within a fairly compact area of roughly four square miles. If each lek in the cluster was surrounded by a one-mile radius area of suitable nesting and brood-rearing habitat, the entire lek and core habitat complex might occupy up to 16 square miles, with a wider perimeter of habitat for autumn and winter foraging and escape cover. This is more or less consistent with the 25,000-acre estimate of Bidwell et al. (2001).

3.36 Landscape composition and connectivity

The ability of a landscape to support LPCs is reduced by the extent of unsuitable or poor quality habitat. Landscape fragmentation is a term that describes the presence of poor quality

habitat, non-use areas, and barriers to dispersal within the range of a species. The loss or fragmentation of broad habitat areas is thought to be the primary factor behind historical LPC population declines. Fragmented or poor-quality habitat may support only declining populations due to high rates of nest failure or other mortality.

Fragmentation affects the broad-scale suitability of a landscape for LPCs in several related ways. When large patches of unsuitable habitat are present, a greater total area may be required to provide sufficient resources to support a viable population. Remaining high-quality habitat occurs in patches that are reduced in size, and distant from one another. Smaller patches can support fewer individuals, are less likely to contain all the different habitat elements that LPCs require throughout their annual cycle, and may become target areas for predators. The effects of patch size reduction are magnified by LPC avoidance of—or increased vulnerability in—"edge" areas close to the source of fragmentation or disturbance. As fragmentation increases, a breeding population may be split into a series of smaller sub-populations, each with a low probability of long-term survival unless significant genetic interchange continues to occur. Dispersal of individuals from one population unit to another tends to be limited by all of the factors mentioned above: the small size and isolation of occupied patches, and the presence of non-habitat areas that may serve as barriers to movement.

Thus from a population perspective, LPC habitat requirements include the presence of large, interconnected areas containing a high percentage of usable habitat. Within such areas, suitable nesting cover must be present in areas within two miles of leks (Wildlife Habitat Management Institute 1999.) Applegate and Riley (1998) state that clumps of nesting habitat should be distributed at a high density—several per acre—to avoid attracting predators. Bidwell et al. (2001) recommend that at least 20 percent of the landscape around leks should support native tall grasses. The distribution of remaining LPC populations suggests that the species cannot survive in landscapes with greater than 37% cultivation, less if other sources of fragmentation are also present (Crawford and Bolen 1976, Bidwell at al. 2001). Recent studies in Oklahoma and New Mexico have noted a correlation between various indices of landscape change or fragmentation and declining LPC populations (Woodward et al. 2001, Fuhlendorf et al. 2002). (Also see discussion under Threats below).

To the extent that a landscape fails to provide large areas of high-quality habitat, it must provide features that prevent the complete isolation of occupied areas from one another. Such features may be corridors or zones of permeability through which successful dispersal can occur. Habitat in these areas may not be of sufficient quality to support year-round occupancy, but must maintain characteristics that allow the passage of individuals. The dynamics and habitat requirements of dispersing LPCs have not been studied in detail, though it may be assumed that, as in all facets of the species' life cycle, escape cover is particularly important.

3.37 Habitat selection and avoidance

Species select habitat, and in this sense the ultimate arbiter of habitat suitability is the species itself. But looking at where a species is distributed at a given moment in time may not produce a full understanding of habitat requirements. In areas with high rates of landscape change, populations may persist for a time even though requirements for long-term survival are no longer met. Species with high site fidelity and slow dispersal rates like the LPC may exhibit a

lag in responding to environmental changes, and thus populations may not efficiently track locations of highest quality habitat (Knick and Rotenberry 2000, Fuhlendorf et al. 2002).

Some features on the landscape may cause behavioral avoidance by LPCs of areas that are suitable in other respects (e.g. appropriate grass and shrub cover). Zones of avoidance may greatly increase the effective fragmentation of a landscape area (Robel et. al 2004). Avoidance may be the result of regular or periodic disturbance—as in areas near a busy road—or perceived threat, as in areas near vertical structures that provide hunting perches for raptors. While LPCs may enter agricultural areas for foraging, they generally avoid farm fields and areas of human activity during periods of nesting and brood-rearing. (See further discussion under Threats below).

3.4 Threats to the LPC in New Mexico

Throughout the range of the LPC, widespread conversion of native prairie to cultivated cropland has been the primary driver of population declines over the past century, and significant threats to the species today continue to be habitat-related. While cropland conversion continues in some areas, populations also contend with reduced habitat quality in remaining prairie rangelands, and with broad-scale fragmentation of historically occupied areas stemming from various forms of development and changing land uses.

LPC population levels naturally fluctuate, declining and rebounding over periods of lesser or greater habitat quality and resource abundance. However, history has shown that such short-term fluctuations may be overlain by long-term trends. A population in which, on average, more breeding-age birds die each year than are added to the population will show a downward trend, and cannot persist if this trend is not reversed. Thus at a very basic level, a threat may be anything that contributes to a negative balance over time between the number of individuals entering and leaving a breeding population.

An important consideration is that, because this balance between mortality and recruitment is the result of many different influences, threats are cumulative. For example, a population decline may be the result of a slight increase in adult mortality coupled with a slight decrease in numbers of nesting attempts, rate of hatching success, and rate of juvenile survival. Each of these effects may be tied to one or more separate or overlapping environmental causes, which may vary in significance from region to region. The multifaceted nature of threats points to the importance of a broad-based conservation strategy, capable of positively influencing species status at a number of critical "leverage points" through which environmental conditions impact population parameters.

All major types of land use within the LPC's range have the potential to affect populations, independently or in conjunction with one another and with natural factors. Principal threats to LPCs in New Mexico may be grouped into three broad categories of impact: degradation of seasonal habitat, habitat loss and fragmentation, and direct disturbance and mortality.

3.41 Degradation of seasonal habitat

Habitat changes occur for a variety of reasons, both natural and human-caused. Climatic variation on seasonal, annual, or longer timescales is perhaps the most important determinant of habitat quality for LPCs in New Mexico. Rainfall patterns strongly influence the availability and quality of nesting and escape cover, and food resources. These factors in turn directly affect the population status of LPCs, as reflected in annual rates of mortality and reproductive success (Merchant 1982). Drought intervals periodically restrict plant growth and reduce habitat quality over large portions of the species' range in the state. Southern portions of the range, which on the average receive less total precipitation (e.g. the Carlsbad region), are impacted more frequently and more severely by drought. Existing data suggest that LPC populations in this region may have always been smaller and more variable than those farther to the north.

LPCs are adapted to a prairie ecosystem with low and variable rainfall, and have persisted through natural extremes of climatic variation in New Mexico including drought periods in the 1930s and 1950s. Populations are thought to have decreased during those periods, and recovered when rainfall returned to average or above-average levels. Impacts of drought may be significantly worsened, however, by other factors which in combination may further reduce habitat quality, or hinder the dispersal of birds to regions where conditions are more favorable (Merchant 1982).

Livestock grazing is the predominant land use across the LPC's range in New Mexico, and thus plays a major role in determining habitat quality. Like rainfall cycles, grazing by large herbivores has always been a significant ecological force throughout the range of the LPC. Grazing is not necessarily detrimental to LPCs, and can be useful in maintaining the varied seasonal habitat required by the species (FWS 1998, Applegate and Riley 1998, Bidwell et al. 2001). In its finding that the LPC is warranted for federal listing, the FWS stated that areas of heavy, moderate, and light grazing are necessary on a landscape scale to provide suitable habitat (FWS 1998). However, grazing that results in insufficient residual grass cover for successful nesting, or otherwise lowers LPC recruitment by reducing the availability of good nesting and brood-rearing habitat, is considered a threat and may cause population declines (Taylor and Guthery 1980, Applegate and Riley 1998, FWS 1998, Leslie et al. 1999, Mote et al. 1999, Bidwell et al. 2001, Jamison et al. 2002).

The impacts of grazing on LPCs can vary widely, depending on climatic conditions, the state or health of range vegetation, and the type of grazing regime employed. Drought tends to magnify grazing impacts, as both processes reduce plant cover. When forage is reduced by drought, what remains tends to be grazed more heavily unless utilization of vegetation is reduced through grazing management practices.. As a result, some grazed areas may supply adequate habitat during periods of normal rainfall, but be unable to support LPCs during droughts (Merchant 1982). Intensive and/or persistent grazing may reduce or eliminate residual tallgrass cover needed for nesting (Davis et al. 1979, Riley et al. 1992, Johnson et al. 1998). Heavy grazing that repeatedly interrupts plant succession over a broad area may result in the conversion of tallgrass prairie to shortgrass or forb-dominated habitat (Litton et al. 1994, Jamison et al. 2001). For these reasons, recent synopses of risk assessment and management guidelines for the LPC have recommended the use of light, deferred, or rotational systems designed to leave interspersed

areas of early and late-stage plant succession (Applegate and Riley 1998, Mote et al. 1999, Wildlife Habitat Management Council 1999, Bidwell et al. 2001, Jamison et al. 2002).

The quality of rangeland habitat for nesting and brood-rearing may also be affected by other processes. In some areas, the spread of mesquite or other drought-tolerant shrubs has altered or reduced the sand sage - grassland or sand shinnery habitats preferred by LPCs. Non-native grasses, as have commonly been planted in Conservation Reserve Program (CRP) fields intended to maintain grassland habitat, may not have the characteristics needed for optimal nest cover. Improper or excessive use of herbicides for shinnery oak control may result in the loss of an important source of food and protective cover, and can make treated areas unsuitable for occupancy by LPCs. Fire, both as a natural ecological process and a management tool, may help provide the necessary range of successional stages LPCs require. On a local scale, however, uncontrolled or poorly managed fire can eliminate residual nesting cover (Peterson and Boyd 1998). Habitat may also be reduced in quality by various forms of landscape fragmentation, which are addressed in the section below.

3.42 Habitat Loss and Fragmentation

Various factors alone or in combination may result in the loss or fragmentation of habitat used by LPCs. Impacts from the pressures discussed above—drought, grazing and shrub incursion—may, if severe and prolonged, make some areas unsuitable for occupancy. Land conversion for irrigated agriculture, or some forms of development, can directly eliminate rangeland habitat. Other forms of infrastructure development, such as construction of roads and power lines, may leave large areas of rangeland relatively intact but create significant zones of avoidance beyond the physical development footprint. In all of these cases habitat is lost and the total area available to support LPCs is reduced.

Across the range of the species, cropland conversion is the primary factor responsible for the large reductions in LPC habitat since the 1800s (Crawford 1980, Taylor and Guthrie 1980). Where cropland conversion is occurring, the area of habitat effectively lost to LPCs may be far greater than the area actually plowed. Landscapes in which more than 37 percent of native rangeland has been lost may be incapable of supporting LPCs, and populations have declined in areas with only 20 percent rangeland conversion (Crawford and Bolen 1976, FWS 1998). In Kansas, LPCs avoided nesting within 300-400 yards of fields with center-pivot irrigation, effectively increasing the impact footprint of agricultural lands (Robel et. al 1994). Irrigation drawing on the Oglalla aquifer has resulted in extensive conversion of LPC rangelands to croplands in Texas and Oklahoma, but this has not been considered a major factor in New Mexico (Leslie et al.1999, Massey 2001). In recent years, however, areas of LPC habitat in Curry and Roosevelt counties have been plowed to grow crops or forage for a rapidly growing dairy industry in eastern New Mexico.

Direct conversion of rangeland to some other land use is only the most extreme of a number of processes that may produce fragmentation of LPC habitat. Other sources of impact on the natural structure and continuity of sand-shinnery and sand sage - grassland habitats include oil field infrastructure and access roads, highways, power lines, fences, buildings, shinnery-oak treatments, and tree plantings or windbreaks. As a group, prairie grouse species may be particularly sensitive to habitat fragmentation due to their short dispersal distances and relatively

broad area and habitat requirements (Braun et al. 1994). Recent LPC declines in the southern portion of its range in New Mexico, although probably at least in part drought-related, have led to concern over the effects of fragmentation caused by oil exploration and drilling (FWS 2002). While it is often difficult to describe cause-and-effect linkages between specific sources of fragmentation and eventual population responses, recent studies have found LPC population declines in Oklahoma and New Mexico to be associated with several measures of overall habitat fragmentation, including patch size, edge density, and total rate of landscape change (Woodward et al. 2001, Fuhlendorf et al. 2002).

Impacts of fragmentation are cumulative, and are often mediated by behavioral responses to whatever change is occurring on the land. A growing body of evidence suggests that LPCs actively avoid areas of human activity, noise, and proximity to vertical elements that may provide hunting perches for raptors, particularly during nesting. Data from several studies indicate that prairie grouse including LPCs may avoid or nest at reduced rates in areas near roads, power lines, compressor stations, and inhabited dwellings (Robel et al. 2004, Braun et al. 2002, Lyon and Anderson 2003). Thus, the presence of these features may result in LPC abandonment of areas that seem to contain a high percentage of otherwise suitable habitat, effectively increasing the impact of these features far beyond their physical footprint. In Wyoming, sage grouse hens from leks located close to roads were less likely to nest (Lyon and Anderson 2003). Recent studies in Kansas showed that LPCs seldom nest within 200 yards of oil or gas wellheads, 400 yards of power lines, 860 yards of improved roads, and 1,370 yards of large structures. The authors calculated that nesting avoidance at these distances would effectively eliminate a large percentage of available habitat to nesting LPCs over a three-county area (Robel et al. 2004).

Studies are currently under way to determine if noise from oil drilling may have played a role in the recent abandonment of a number of historically active lek sites in the Carlsbad area. Preliminary data over two years show that inactive lek sites are exposed to higher ambient sound levels than active sites (Hunt and Best 2002). The same study also reports a significantly higher number of operating wells within one mile of inactive than active lek sites. Whether this pattern of lek abandonment reflects sensitivity to noise or some other form of disturbance associated with drilling activities, or is a response to factors not associated with drilling, remains unknown. However, all of these studies emphasize the importance of taking behavioral avoidance into consideration when assessing development impacts on LPC habitat.

Landscape features that reduce the size of contiguous habitat patches can be barriers to movement and dispersal. Individuals forced to venture into marginal areas in search of resources may be at increased risk of predation or other causes of mortality. This kind of impact may be increased during drought, when LPCs typically expand their home range size to gain access to suitable habitat (Merchant 1982). On a broader scale, barriers to dispersal between lek sites or complexes can isolate breeding populations, and lead to a series of deleterious effects associated with small population size. Small populations are inherently more vulnerable to periodic disturbances that may cause a downward fluctuation in numbers. They may also experience reduced vitality due to losses of genetic diversity. When a large breeding population is divided into a series of isolated units, gene flow is reduced and inbreeding occurs. Over time, this may reduce breeding success. Long-term studies of the closely related Greater Prairie-Chicken

tracked a process in which reduction in population size (from 2000 to 50 over 30 years) was accompanied by reduced fertility and hatching rates, which in turn contributed to declines and offset habitat improvements intended to help the population recover (Westemeier et al. 1998). Although one recent study (Van den Bussche et al. 2003) has found that LPCs in fragmented habitat in New Mexico and Oklahoma do continue to maintain high levels of genetic variation, increased or prolonged separation of small populations would likely deplete the genetic resources needed to ensure long-term viability.

3.43 Direct Disturbance and Mortality

A number of different influences may result in increased mortality of LPCs, or in disturbance to a degree that reduces breeding success. As discussed in the previous two sections, habitat quality and degree of fragmentation play a primary role in determining how large an impact any potential source of mortality or disturbance will have on a population. LPCs naturally experience a fairly high rate of annual mortality. Potential threats include anything that may add to normal or "background" mortality rates in a population, or reduce that population's capacity to offset losses with new birds produced.

Predation is by far the largest source of mortality for LPCs. Species known to take eggs from LPC nests include Chihuahuan raven, raccoon, striped skunk, ground squirrel, coyote, badger and bullsnake. Species that may prey upon chicks and adult LPCs include red-tailed hawk, ferruginous hawk, golden eagle, Cooper's hawk, prairie falcon, northern harrier, great-horned owl, coyote, raccoon, and fox (Giessen 1998). Predation on eggs and chicks is particularly significant as a factor that may limit population growth. Adult LPCs are also highly vulnerable during lekking, while dispersing to nesting areas, and while incubating eggs. In New Mexico, nearly half of the annual predation on female LPCs occurred during the month of May, and 40% of predation on males occurred from March to May (Wolfe and Patten 2003). In Kansas, of 109 adult LPC mortalities for which a cause was determined, 66% were due to predation by mammals and 19% due to predation by raptors (R. J. Robel, pers. com.). In Oklahoma, 25% of 100 mortalities were attributed to mammal predation and 33% to raptor predation (Wolfe et al. 2003).

Predation rates are influenced not only by habitat quality and availability, but also by changes in native prairie bird and mammal communities. In the northern Great Plains, declines in top-level predators have been associated with increases in potential nest predators and reduced success of ground-nesting species (Garrettson et al. 1996). Numerous studies have found higher rates of nest predation on different bird species in fragmented landscapes containing more edge and smaller patch sizes. The introduction of trees, power lines, or other vertical structures into prairie habitats provides hunting perches for raptors and may indirectly increase raptor predation on LPCs (Bidwell et al. 2001).

Fences and power lines may also be a significant cause of direct mortality by collision (Bidwell et al. 2001). Ligon (1951) expressed concern that spread of these features in eastern New Mexico might severely limit LPC populations. Like other prairie grouse, LPCs fly at low elevations and may have limited ability to see and avoid obstacles. The full extent of collision mortality is not known and is difficult to measure as killed birds are quickly removed by scavengers. In Kansas, mortality attributed to power line collisions was only 5% of the total

observed (R. J. Robel, pers. com.). Collision mortality was greater in Oklahoma, where fence collisions accounted for 32%, and power line collisions accounted for an additional 6%, of known LPC mortalities.

The amount of LPC mortality due to vehicular traffic is unknown. Off-road vehicle (ORV) use is largely unrestricted across the LPC range in New Mexico. ORVs are used both by recreationists and by hunters seeking access to hunting areas. Construction of roads for energy development may open up areas to increased ORV use . While data on ORV impacts are lacking, their presence clearly has the potential to disturb lekking and nesting activities. Other potential sources of mortality associated with human activities include trampling of nest sites by cattle, and effects of oil and gas pollution. Legal hunting of LPCs in New Mexico was discontinued in 1996, but poaching or inadvertent take by hunters of other upland gamebird species remains a potential cause of mortality. Disease is not known to be a significant contributor to LPC population declines, but few studies have been undertaken. One recent survey for infectious agents in LPCs in north Texas produced generally negative results (Peterson et al. 2002). While some parasitic infections have been recorded, their population-level significance is unknown. Mote et al. (1999) note that given the generally small and scattered nature of LPC populations, a disease transmitted independently of population density could have drastic effects.

3.5 SDL distribution and status

A form of lizard described as a subspecies of the Sagebrush Lizard was first reported in southeast New Mexico in 1960. In 1992 this taxon was formally recognized as a unique species, the Sand Dune Lizard (*Sceloporus arenicolus*). The SDL is endemic to a small area of shinnery oak habitat in southeast New Mexico and adjacent west Texas. It is the second most narrowly distributed species of any native lizard in North America. The full extent of the species distribution in Texas is unknown, although it includes parts of at least five counties. Knowledge of the historic distribution of the SDL in New Mexico is limited. The historic range is thought to have been larger than the area occupied today. Currently the SDL occurs in parts of Chaves, Eddy, Lea, and Roosevelt counties (see Map 2). Potential and occupied habitat within the species New Mexico range is fragmented, and consists of roughly 650 square miles divided into several distinct geographic areas, separated by significant areas of unsuitable habitat. The overall range in the state is crescent-shaped and about 16 miles wide, extending from the area around Milnesand in Roosevelt County to west of the Mescalero Ridge (Caprock), and southeast to the Texas border south of Hobbs (Painter et al. 1999). About half of the SDL habitat in New Mexico occurs on lands administered by the BLM; important areas also occur on NMSLO lands and private lands. Some 228 square miles (approximately 145,970 acres) of the SDL range falls within the Roswell BLM Core Management Area (CMA), where special management protections exist. See further discussion under 3.8, "Threats to the SDL in New Mexico", below.

Some SDL populations known or discovered in New Mexico since 1960 have decreased or become extirpated. Disappearance of SDL populations from areas that were treated with herbicide to remove shinnery oak was documented by Snell et al. (1997). Painter et al. (1999) estimated that about 25 percent of the total SDL habitat in New Mexico had been eliminated in the previous ten years. These and other reports raised concerns about the effects of increasing

density of surface development on remaining SDL populations. See further discussion under 3.8, "Threats to the SDL in New Mexico", below.

The SDL was recently (2005) upgraded from "threatened" to "endangered" by the NMDGF, and is listed as a sensitive species by the BLM. Since 2001 the SDL has been considered a candidate species for federal listing by the FWS under the Endangered Species Act—see 3.9, "Endangered Species Act considerations," below.

3.6 SDL species ecology, life history and population dynamics

Ecological and reproductive strategies of the SDL are the subject of ongoing studies. In occupied habitat, the SDL may be locally common. It is active between April and September, hibernating in underground burrows during the winter months. The species is diurnal and wary, and tends to stay close to vegetative cover while hunting. Individuals bury themselves in sand to prevent overheating and avoid predators. Thus dune sand is important to the daily survival strategy of the SDL. The species' diet consists of ants, small beetles, crickets, grasshoppers, and spiders (Painter et al. 1999).

Breeding typically begins in late April. Females can reach sexual maturity during their first spring following hatching, and produce one to two clutches per year. Clutch sizes range from 3 to 6 eggs, with older females producing larger clutches. Eggs are buried in sand at a depth of 5-6 inches. Hatchlings emerge from July to September. Dispersal patterns of juveniles and adults are poorly known but are being studied. Recent studies suggest that dispersing juveniles may utilize shinnery oak flats connecting dune complexes (Painter et al. 1999, Painter and Fitzgerald, *unpublished data*).

3.7 SDL habitat requirements

From a conservation perspective, the key biological characteristic of the SDL is the species' highly specific set of habitat requirements. The species occurs only in the microhabitat of sand dune "blowouts" (open, low-lying areas between active dunes) in areas dominated by shinnery oak and scattered sand sagebrush. The species is not found at sites lacking shinnery dune habitat, including shinnery flats, except during dispersal as noted above. Even in dune areas it avoids extensive shinnery patches between blowouts. Studies of SDL activity have shown that larger and deeper blowouts are preferred. Sand grain size may also be a factor, with the SDL appearing to avoid areas of particularly fine-grained sand (Fitzgerald et al. 1997). This may be because small particles interfere with gas exchange through the lizard's skin. Individual SDL's have relatively small home ranges, as indicated by the frequent recapture of marked animals within the blowout of original capture (Painter et al. 1999).

3.8 Threats to the SDL in New Mexico

The principal threat facing the SDL is further habitat loss and/or fragmentation. More specifically, SDL populations may be threatened by activities that remove shinnery oak, alter the dominant vegetative structure, increase the percentage of grasses, disrupt the morphology of sand dunes, or otherwise degrade suitable or occupied habitat (FWS 2004, Painter et al. 1999).

Recent reports and species status reviews by the NMDGF, FWS and others have focused primarily on two types of activity that have affected and continue to affect the status of the SDL: removal of shinnery oak by herbicide application, and surface-disturbing activities including those associated with oil and gas development. Research is ongoing to better understand the longer-term impacts of each.

3.81 Shinnery oak removal

Historically in the Mescalero Sands region of southeast New Mexico, at least 100,000 acres of shinnery oak habitat has been removed by herbicide treatment (Peterson and Boyd 1998). The SDL is restricted to shinnery oak dune complexes, and it is clear that shinnery oak removal results in reduced SDL populations. Research conducted between 1991 and 1995 showed a strong correlation between shinnery oak removal and reductions in the density of SDLs. In a comparison of herbicide-treated and untreated sites, SDL numbers decreased 70-94% in the treated areas. These negative effects were attributed to changes to the vegetative community and dune structure following removal of shinnery oak (Snell et al. 1997). Increased grass cover, dune stabilization, and decreased dune relief are all consequences of shinnery oak removal, and these changes may threaten the persistence of SDL populations. In response to evidence of negative impacts on SDL and LPC habitat, the BLM has discontinued chemical treatment of shinnery oak on lands it administers in southeast New Mexico since 1997. However, the practice continues on private and state lands.

3.82 Development disturbance

Studies to investigate how patterns of oil and gas development in shinnery dune areas may impact SDLs were begun in 1995. Initial studies found an average 37% decrease in SDL abundance in areas within 80 meters of individual oil or gas wells, compared to more distant areas (Sias and Snell 1996). Other studies have looked at the relationship between overall well density and SDL populations. SDLs were found throughout oil and gas fields at all well densities; however, statistical regressions indicated greater impacts to SDL populations as well densities increase (Sias and Snell 1998). Data collected by Sias and Snell (1998) predict a 25% decline in SDL populations when well densities are around 14 wells per section, and a 50% decline at densities of around 25 wells per section.

3.83 Cumulative effects of fragmentation

Cumulative effects of localized disturbances caused by shinnery oak removal or surface development may be spatially widespread population reductions. Shinnery dune habitat may be compromised or lost in areas of high road, rights-of-way, and well densities (e.g. 25 wells per section). Several such areas exist in southeast New Mexico within the range of the SDL (Painter et al. 1999). In some locations, where dense development has existed for several decades, SDL populations persist, albeit in reduced numbers. Thus the species does show some ability to co-exist with surface development activities (Painter et al. 1999). Long-term population effects of existing and additional future development cannot be known with certainty, but biologists and management agencies have expressed a high level of concern.

Additional loss of shinnery oak habitat in certain key areas may have a significant negative impact on SDL population dynamics. In some locations, remaining shinnery oak dune habitat forms a narrow band less than a mile wide. Additional fragmentation in these areas may create

barriers to SDL dispersal and gene flow (Painter et al. 1999). Past management has encouraged directing new development into shinnery oak flats and out of dune areas; however, the discovery that flats may be important to SDL dispersal raises new concerns over development in these areas (FWS 2004).

New mineral leasing has been suspended since 1997 over the significant portion of the SDL's occupied range that falls within the BLM Roswell CMA, limiting the potential for surface disturbance in this region. The CMA includes some 130 square miles of land (approximately 86,810 acres) with unleased federal minerals that fall within the range of the SDL. BLM also requires Plans of Development as a means to assist in mitigating impacts on existing leases.

Other threats

Concentrated Off Road Vehicle (ORV) use may be injurious to SDLs, and may alter sand dune structure. Apart from one designated ORV use area at Mescalero Dunes, ORV use is thought to be relatively limited within the range of the SDL in New Mexico, and significant impacts have not been demonstrated. Use of "thumper trucks" for seismic oil and gas exploration has the potential to crush hibernating lizards and underground nests. No data are available on the extent to which this impact may occur.

Currently there is no evidence that cattle grazing directly threaten the SDL, apart from the associated strategy of shinnery oak removal for rangeland management. Some grazing may help maintain shinnery oak dunes. Populations of SDLs at varying densities are found in grazed shinnery oak pastures. As discussed in section 3.41, livestock grazing does have the potential to alter the vegetative composition and structure of shinnery oak rangelands. How such changes may affect SDL populations remains a subject for future research.

3.9 Endangered Species Act considerations

The Working Group is concerned that both the LPC and SDL are on the candidate species list for federal listing under the Endangered Species Act (ESA). As stated in Chapter One, the goal of the Working Group is to develop and implement conservation strategies that would reduce or eliminate the need for such listing. In this regard, it is important that all parties share an understanding of how legal processes relating to listing and candidate species work, how the FWS views the current status of the LPC and SDL, and how existing conservation efforts are evaluated by the agency at the time a listing decision is made.

3.91 Factors considered for listing

Under Section 4 of the ESA, a species may be determined to be threatened of endangered due to one or more of the following factors:

1. The present or threatened destruction, modification, or curtailments of the species' habitat or range.
2. Overutilization for commercial, recreational, scientific, or educational purposes.
3. Disease or predation.
4. The inadequacy of existing regulatory mechanisms.
5. Other natural or manmade factors affecting the species survival.

The FWS is responsible for evaluating each of these factors and making a public finding on the status of the species with regard to each. In 1995, the FWS received a petition to list the LPC as threatened within its historic range. In 1998, the agency published in the Federal Register its finding that listing the LPC was warranted, but precluded by other listing priorities (63 FR 31400, June 9, 1998). In 2001 a similar finding was published for the SDL.

3.92 Present status: warranted but precluded

Due to the large number of potential listings and the time required to list a species, many listings are deferred due to other, higher priority species. In such cases the species is given a "warranted but precluded" status and placed on the FWS candidate species list. The FWS employs a priority system designed to direct agency efforts toward the plants and animals in greatest need of protection. In this system the degree or magnitude of threat is the highest criterion, followed by the immediacy of the threat and the taxonomic distinctiveness of the species (monotypic genus, then species, then subspecies, variety, or vertebrate population).

In its 1998 ruling on the LPC, the FWS reviewed the population status of the species and information pertaining to each of the five listing factors. Habitat loss and modification were cited as principal factors of concern. While potential conservation benefits of grazing were noted, a need for grazing management that ensures retention of medium and tall grass cover and other structural diversity was emphasized. Overutilization and disease or predation were not considered primary threats, though a possible relation between predation and nest success was noted. Existing regulatory mechanisms were considered, including guidelines present in the BLM's 1997 Resource Management Plan for the Roswell district. This section concluded that "a regulatory mechanism may not exist to ensure development of standards and guidelines that favor LPC habitat needs." Finally, under the "other factors" heading, the ruling noted the sensitivity of LPC populations to drought. The overall magnitude of threats to the LPC were determined to be moderate, but ongoing.

Warranted-but-precluded species require subsequent 1-year findings (Candidate Notice of Review, CNOR) on each succeeding anniversary of the initial petition for listing, until either the species is proposed for listing or a "not warranted" finding is made. The LPC undergoes an annual CNOR; since 1998 its candidate status has not changed. In its annual reviews the FWS issued threat assessments similar to the original finding, focusing on habitat issues and inadequacy of existing regulatory mechanisms. In 2002, new comments were added noting the "recent extirpation of nearly all LPC populations and active leks south of Highway 380 in New Mexico" (FWS 2002). In that notice the FWS stated that is was "very concerned that unrestricted disturbance and landscape fragmentation within large remaining tracts of undeveloped BLM property, coupled with excessive grazing utilization and further weakening of existing policies, may preclude population recovery on BLM lands in southeastern New Mexico."

The SDL was ruled warranted but precluded for federal listing in 2001. In its most recent (2004) candidate species assessment for the SDL, the FWS focused on habitat loss or modification, and the inadequacy of existing regulatory mechanisms. The report notes that oil and gas development in southeast New Mexico has accelerated in recent years, and cites specific areas of

concern in Lea County. The FWS states its concern that considering the SDL's small geographic range, "the magnitude and imminence of threats, and the vulnerability of extant localities, the lizard is likely in danger of extinction in all or a significant portion of its range" (FWS 2004). The report notes the reduction in shinnery oak removal under current BLM policies, but also the lack of an agency plan that address threats to the species or specific conservation and recovery needs. Additionally, there are no local or state regulatory mechanisms pertaining to SDLs on state and private lands (FWS 2004).

3.93 Policy for the Evaluation of Conservation Efforts (PECE)

The FWS supports the development of conservation efforts designed to reduce or eliminate threats to candidate species. Recently the FWS issued a new Policy for Evaluation of Conservation Efforts (PECE). PECE is applied when listing decisions are being made, to evaluate whether formalized conservation efforts may be sufficient to make listing unnecessary, or to warrant listing as threatened rather than endangered. Under PECE, the FWS will evaluate whether ongoing and anticipated efforts to conserve a candidate species, such as may be described in a conservation agreement or plan, are sufficient to improve the status of the species with regard to the five listing factors specified in the ESA. This evaluation is based on two broad standards: certainty of implementation and certainty of effectiveness.

Criteria for evaluating certainty of implementation include identification of all parties, funding sources, and other resources required; establishment of the legal authority of parties to implement the agreement; demonstration that all regulatory mechanisms and procedural requirements will likely be met, and that all needed authorizations and permits will be acquired; and demonstration with a high level of certainty that there will be voluntary participation and funding necessary for implementation.

Criteria for evaluating certainty of effectiveness include description of the nature and extent of threats being addressed, and of how the conservation effort reduces them; explicit incremental objectives for the conservation effort; identification of the steps necessary to implement the conservation effort; specification of quantifiable, scientifically valid parameters that will demonstrate achievement of objectives; provisions for monitoring and reporting progress; and incorporation of principles of adaptive management.

As PECE demands, the conservation strategies presented here for the LPC and SDL take many forms and address a variety of threats to the species. Some describe efforts already well underway; others will require additional planning with a focus on funding and implementation. Some present general recommendations that may be further elaborated and formalized in other plans and agreements. Taken as a whole, the Working Group believes that the set of efforts described in the next chapter represent a significant step toward meeting PECE criteria. These efforts will significantly reduce or eliminate threats that might otherwise lead to federal listing of the LPC and SDL in New Mexico.

Chapter Four: Lesser Prairie-Chicken Conservation Strategy

Introduction

The strategies and recommendations presented in this chapter have been crafted by the Working Group with FWS listing factors and PECE criteria in mind. The strategic approach aims to be comprehensive, addressing each principal area of LPC conservation need in a series of "pathway" sections (explained below). At the same time, it should be emphasized that this is a broad-scale statement of recommended strategies, not a detailed operational plan for LPC conservation. The strategy sections lay out general approaches, priorities and parameters for achieving the goal of LPC conservation and recovery while maintaining economic values and traditional land uses. For some strategies, negotiations required specification of a greater amount of operational detail. In every case, however, further details of planning and implementation remain to be worked out. This work must continue in a variety of contexts, by the different agencies through their own planning processes and by an ongoing advisory group or groups with stakeholder representation.

This chapter offers a strategic foundation upon which future operational planning efforts can be established and coordinated. (Chapter 5 suggests some directions this next round of work might take.) The Working Group considers it essential that future conservation work be directed toward carrying out the strategies presented here, around which broad consensus has been reached.

The conservation strategies are preceded in this chapter by important sections that explain the pathway approach, the three planning regions to which various strategies refer, and the landscape analyses upon which some strategies are based. Equally important is the discussion of "prerequisites" that the Working Group has identified as being essential to achieving conservation and land use goals.

4.1 Strategy orientation: conservation pathways

Following from the discussion of threats in Chapter 2, the overall conservation strategy for the LPC is organized around a series of "pathways" for conservation or management action. While each contains an implied objective, the word "pathway" was chosen to emphasize a flexible and multifaceted approach toward meeting conservation and land use goals.

Pathways 1-5 are intended to focus current and future conservation efforts around several key issues that, based on current knowledge of biological requirements and threats to the species, have the greatest and most direct bearing on survival and recovery. For the LPC these include efforts to increase recruitment by management and enhancement of rangeland habitat, minimize habitat loss and fragmentation due to development, establish a reserve network on a landscape scale, reintroduce populations into portions of the historical range, and provide protections from direct mortality or harassment. Within each of the five conservation pathways a number of

specific strategies (for the most part management practices or projects) are identified that the group believes will be both feasible and effective in reducing threats. These are presented under each numbered pathway in decimal form: Pathway One includes Conservation Strategies 1.1, 1.2, etc.

Pathways 6-9 describe areas where coordinated support is needed to increase the precision, effectiveness, and scope of on-the-ground conservation efforts. These include strategies for research and monitoring, education and outreach, planning and adaptive management, and securing funding. Collectively, the pathways reflect and represent the progress of the Working Group to date, both in identifying conservation priorities and in reaching a broad consensus as to priority actions and stakeholder or agency responsibilities. They provide the framework upon which more detailed action plans and implementation strategies can be based.

4.2 Planning regions and management priorities based on population status

The pathways describe a coordinated but multifaceted approach to LPC conservation. Biological and land use issues vary from region to region across the planning area, and different strategy elements will assume greater or lesser importance in different locations. In order to facilitate management planning and prioritization, for some strategies the Working Group has adopted a regional approach, based on the three-part division of the LPC historic range described in Chapter 3. Although this scheme describes differences in the status of LPC populations—isolated, sparse and scattered, or well-distributed—lands in the different categories occupy (for the most part) geographically distinct areas, with differing characteristic patterns of land ownership and use (see Map 3). This division is made even more explicit in strategy 2.1, which presents recommended guidelines for mineral leasing in each of the three areas. In other sections, broad strategies are described that may apply generally over all three planning regions.

1. **Well-distributed** LPC populations occur in a **Primary Population Area (PPA),** situated north of Highway 380 and (mostly) south of New Mexico Township 5 in north Lea, south Roosevelt and northeast Chaves counties. (The PPA surrounds all but the southernmost portion of the Roswell BLM's Core Management Area.)

2. **Sparse and Scattered Population Areas (SSPA)** are areas where leks have become sporadically distributed, and where the species may be facing local extirpation. These occur in the area north of the PPA, primarily in north Roosevelt and Curry counties with small portions of east De Baca and south Quay counties, and also in southeast Chaves county south of Highway 380.

3. An **Isolated Population Area (IPA)** exists in the southernmost portion of the LPC's historical range, in Lea and Eddy counties. In this area the LPC is considered extirpated, or nearly so. For convenience this region is sometimes referred to as the **Carlsbad Area.** (Other portions of the former LPC range in northeast New Mexico, where populations have been extirpated in recent historical time, remain of concern but have been largely beyond the scope of the present Working Group effort.)

A regional planning approach based on differences in population status helps to prioritize management actions and the allocation of conservation resources in different areas. The Working Group recommends that the following guidelines be considered:

- Sparse and scattered population areas should be considered highest priority for management efforts to locate, monitor, and protect existing leks and surrounding habitat, and to establish new LPC reserve sites.
- Portions of the IPA should be considered high priority for expanded surveys, habitat improvement, and reserve site establishment.
- Areas where LPC populations remain well-distributed should be viewed as high priority for ongoing habitat protection, maintenance and enhancement in conjunction with ongoing economic land uses, and for research to develop or test the efficacy of new management practices.
- In addition, any areas where LPC populations or suitable habitat face imminent threats of habitat conversion or development should be considered highest priority for strategies aimed at preventing habitat loss or minimizing development impacts.

4.3 Landscape analysis

As the Working Group began its deliberations, it soon became clear that the scope, effectiveness, and impacts of different strategy options could not be fully assessed without precise and up-to-date knowledge of existing conditions in the planning area. Thus, an essential step towards meeting Working Group goals has been the development of an increasingly detailed analysis of existing land status and use across the three planning regions. Much progress has been made in this effort, with significant contributions by the BLM, NMDGF, SLO and the New Mexico Natural Heritage Program. Further survey, site-assessment, and mapping efforts are ongoing.

Landscape analysis is facilitated by the use of GIS technology for compiling and mapping different types of information. The main categories of information considered in the Working Group's conservation planning effort include land and mineral ownership, species distribution, and distribution and quality of habitat.

Land ownership and surface and mineral lease status

The planning area is a complex matrix of private, state, and federal lands, with active grazing and mineral leases administered by both the BLM and the SLO. In some areas surface and mineral ownership rights are under separate authorities, resulting in a "split estate". Different combinations of land and mineral ownership, lease status, and use present different possibilities and constraints for conservation planning.

LPC distribution

Because LPCs return each year to traditional known lek sites, it is possible to map the distribution of occupied habitat with some precision using data gathered from ongoing annual surveys. In some areas, however, (particularly on private lands) survey effort has been insufficient to detect all active leks. There is also some turnover from year to year as new lek sites become active and old ones become inactive. For planning purposes it is important to have

as thorough and current a representation as possible of where LPC leks are located, drawing from all relevant sources of survey data. This is particularly important in assessing the effects of specific policy recommendations that apply to occupied habitat areas around lek sites. To create as complete a picture as possible of LPC distribution in New Mexico, the Working Group recommends increased survey effort in some areas to locate all active leks, and information sharing among all entities carrying out LPC surveys and/or administering survey data.

Distribution and quality of habitat

The value of any habitat area to LPCs is determined by a combination of natural conditions, which vary through time and space, and the existing legacy of surface disturbance or development impacts. The central and most challenging component of landscape analysis is the detailed depiction of habitat in terms of degree of surface disturbance and current or potential conservation value.

On the broadest scale, LPC habitat is defined by the natural distribution of appropriate vegetation types: shinnery oak grasslands and dunelands, and sand sage grasslands. However, much of this habitat has been impacted—to varying degrees—by past land use practices including herbicide treatments of shinnery oak, and different forms of development. Surface disturbance, alteration, and fragmentation all may reduce habitat quality to a degree that may reduce or preclude occupancy by LPCs (see Chapter 3, Threats to the LPC in New Mexico).

Landscape analysis efforts currently under way are directed towards synthesizing all available information on species distribution, surface disturbance, and habitat quality across the three planning regions. The purpose of such analysis is to help identify areas where different conservation strategies may be most feasible and useful, and areas that may be of less importance to conservation where development may be a higher priority.

In the PPA, a complete map of vegetative cover types, based on satellite data and ground surveys, has been created by the New Mexico Natural Heritage Program (NMNHP) and the Earth Data Analysis Center (EDAC) at the University of New Mexico. LPC leks and various surface infrastructure features are also included. This map is central to the Working Group's recommendations for mineral leasing in the PPA (see Conservation Strategy 2.1) and will be updated periodically. Planning has also drawn on maps produced by the BLM in undertaking habitat suitability analyses for the LPC in the Roswell and Carlsbad districts. In the Carlsbad area, analysis has led to preliminary identification of habitat areas that may be important for future restoration and recovery efforts.

Negotiations over the PPA led to a division of lands into four defined categories (see Conservation Strategy 2.1). While the same level of analysis has not yet been undertaken in the other two planning regions, the following terms are used throughout and reflect the basic biological template of the LPC's historical range in New Mexico.

1. **Unsuitable habitat** describes areas lying outside any of the shinnery oak or sand sage vegetation types used by LPCs for nesting and brood rearing.
2. **Potentially suitable habitat** describes unoccupied areas within an appropriate vegetation type with varying levels of development and/or fragmentation; most has recovery potential.

3. Suitable habitat describes unoccupied areas within an appropriate vegetation type, with minimal development or fragmentation impacts.
4. Occupied habitat describes all areas within 1.5 miles of active lek sites, regardless of vegetation.

Note that these terms do not address variation in habitat quality as may occur from year to year and from location to location due to factors such as rainfall and grazing management. Areas of suitable habitat may differ greatly in terms of rangeland condition and habitat quality. Further specification of habitat quality is provided in Pathway One. A more precise distinction between suitable and potentially suitable habitat is provided in Pathway Two.

While this classification scheme is useful as a tool for planning and setting policy guidelines, it is based on broad-scale survey data that may not fully capture existing conditions at different locations on the ground. It is understood that further, site-specific evaluation of conditions will often be needed, particularly in cases where management decisions may be contingent upon a determination of habitat suitability or occupancy.

Further applications of landscape analysis are discussed in conservation strategies 2.1 and 3.4.

4.4 Prerequisites for stakeholder support and implementation

In Working Group deliberations over different conservation strategies, certain requirements were repeatedly mentioned as being critical to success. These are addressed in terms specific to each pathway and conservation strategy in the sections to follow. More generally, however, the group would like to highlight the following elements as being broad in scope and vital to the attainment of many or all pathway objectives. As such, these elements should be considered prerequisites to effective development and implementation of the entire Conservation Strategy for the LPC and SDL. ***Every effort must be made to ensure that the following conditions are met, for all strategies and in all geographic areas where strategies are being pursued.***

- **Landowner assurances**. To gain the support and cooperation of private landowners for conservation efforts on both private and public lands, management agencies—in particular the FWS—must provide protections to landowners such that voluntary conservation actions do not lead to penalties or other restrictions in the event of state or federal listing. Mechanisms for providing such protections exist, but may be poorly understood or viewed with skepticism by landowners. It is in the interest of all parties that landowners be fully aware of all the options and legal assurances available to them, and that the FWS facilitate the establishment and signing of these agreements. See also Conservation Strategy 3.4 regarding Candidate Conservation Agreements with Assurances.
- **Incentives for voluntary conservation efforts**. While CCAAs, Safe Harbor agreements, and other programs remove a powerful disincentive for landowner participation in species conservation and habitat improvement efforts, this is not sufficient. Many of the strategies described in this document, such as more conservative grazing management to improve habitat quality for LPCs, carry costs which must be offset to ensure voluntary participation. Stewardship values, rangeland improvement,

and a sense of personal responsibility all may provide strong incentives for instituting management practices that will benefit threatened wildlife. However, even where these values and motivations exist, economic considerations make the existence of financial incentives to offset costs essential to securing private landowner support for, and involvement in, this conservation effort.

- **Agency focus and flexibility**. Successful implementation of this conservation strategy will require the full support of land management agencies, from the highest organizational levels to regional or district offices. In particular, the BLM, NRCS, NMSLO, and NMDGF must have a capacity to prioritize LPC and SDL conservation across organizational and divisional boundaries, streamline decision-making and process requirements related to strategy implementation, show flexibility in pursuit of overall policy objectives, and devote sufficient resources to carry out strategy recommendations, including ongoing monitoring, planning, and adaptive management.
- **Goals and standards**. All conservation efforts should be undertaken with clearly stated goals and agreed upon standards for monitoring outcomes. Goals and standards presented in this document may serve as a beginning, but for many strategy elements more specific criteria need to be developed.
- **Planning for success**. Implementation must proceed with a clear expectation that strategies will be pursued for as long as necessary to secure LPC and SDL populations, but not beyond the point of necessity. Private parties who willingly assume responsibility to carry out actions or enter agreements described in this or future strategy documents should be assured that requirements may become less burdensome as goals are achieved.
- **Leadership**. Continued leadership is required from all members of the Working Group, to advocate full support for this Conservation Strategy from each member's respective agency, industry, or conservation constituency. Only with the full support of these larger constituencies can the goals of the Working Group and this document be realized. Leadership in building individual and private organizational support for efforts on both private and public lands is particularly important.

4.5 Objectives for the conservation strategy

The Working Group recognizes two broad sets of objectives for its Conservation Strategy:

Conservation objectives

Establish and maintain healthy, self-sustaining populations of LPC and SDL in sand shinnery and sand sage-grassland communities of southeastern and east-central New Mexico, through habitat preservation and improvement, species protection, and other measures, such that inclusion of these species populations in any future listing actions under the Endangered Species Act is not needed.

Land use objectives

Achieve species and habitat conservation through cooperative problem-solving among stakeholders, continued, new or expanded programs of agencies and NGOs, voluntary commitment to implementation of recommended practices, and ongoing adaptive management such that traditional land uses are maintained and human livelihoods are protected.

Pathways to achieve these goals follow. Direct, on-the-ground conservation efforts are described in Pathways 1-5. Additional support strategies for conservation success are described in Pathways 6-9.

Pathway 1: Increase seasonal habitat quality and LPC recruitment on rangelands and CRP lands

- Conservation Strategy 1.1: Conservative grazing management in important habitat areas, with compensation for ranchers
- Conservation Strategy 1.2: Enhanced CRP management
- Conservation Strategy 1.3: Mesquite control
- Conservation Strategy 1.4: Shinnery oak management

Pathway overview: Opportunities and challenges

The most direct and effective means of improving the population status of LPCs in New Mexico is to enhance characteristics of rangeland habitat needed for successful nesting and juvenile recruitment. Such an approach takes advantage of the LPC's inherent biological capacity for population increase; whenever and wherever annual mortality can be limited by the presence of suitable vegetation. This pathway focuses on improving the quality of suitable and potentially suitable habitat for LPC nesting and brood rearing, in areas around active lek sites or where known leks have existed in the past. It is concerned primarily with the management of vegetation on rangelands and CRP fields. Development-related impacts on LPC habitat are addressed in Pathway 2.

As discussed in the previous chapter, grazing and drought have historically been dominant ecological forces throughout the sand-shinnery and sand sage-grassland ecosystems. Grazing is not considered to be incompatible with healthy LPC populations, and in fact may be an important tool in managing for species protection and recovery. A central challenge however is to ensure that, in areas where LPC leks are present, grazing occurs in a manner that allows suitable nesting and brood-rearing habitat to be maintained (Applegate and Riley 1998, Bidwell et al. 2001, Jamison et al. 2002). An equal challenge is to achieve these safeguards for LPC habitat without negatively impacting the economic interests of ranchers and ranching communities.

The Working Group has identified a set of strategies for preserving habitat quality and boosting LPC recruitment on rangelands and CRP lands. The conservation benefits to be achieved are cumulative across the range of the species in New Mexico, but different strategy elements or combinations of elements may apply in different locations. The rangeland habitat of the LPC is spread across a matrix of federal, state, and private lands, and different management tools and funding mechanisms are required for each. However, all these efforts should be guided by, and revolve around, a common set of standards for defining habitat quality. The technical committee of the Working Group has proposed a set of standards, which describe "high quality" nesting and brood-rearing habitat in terms of vegetative composition and structure (see Definitions and Standards below). These standards may be used to set goals for, and evaluate the success of, management efforts.

The Working Group's mission has been to devise conservation solutions for the LPC that protect the interests of property owners and land users. The group understands that the economic balance of many ranching operations is precarious, and may be upset if forced restrictions on

grazing operations are imposed. Failures may lead to the sale and potential development or conversion of important habitat areas. For these reasons it is considered essential that needed reductions or changes in grazing regime, specifically to benefit LPCs and other at-risk wildlife species, be accompanied by fair compensation to ranch operators, or be achieved through a program that provides stewardship incentives to voluntary participants. To be truly successful, any such program must be able to guarantee a secure source of long-term funding. It is equally essential that contractual assurances be made available to private landowners participating in a conservation program, such that their economic interests are protected should listing occur.

Alongside compensation or incentive-based programs for livestock reduction, several other strategies can help achieve the combined goals of improving habitat for LPCs, reducing grazing pressure on sensitive areas, and maintaining the economic security of ranchers. These include enhanced management of CRP lands, enrolling additional cropland into the CRP, inter-seeding desirable grasses and forbs into native rangelands, mesquite control to improve both LPC habitat and livestock forage, and limited use of herbicides to control shinnery oak where conditions warrant. All are considered here as elements of a single conservation pathway directed towards meeting the biological and economic requirements of LPC habitat enhancement on rangelands in eastern New Mexico.

Definitions and standards

Management to provide or maintain optimal conditions for LPC nesting, brood-rearing, foraging and concealment requires a set of target standards specifying vegetative composition and grass height (visual obstruction). Based on work by the five-state LPC working group, and other studies, the technical committee of the Working Group has agreed on the following description and standards for quality habitat.

Habitat description

A number of different shrubland and grassland vegetation types with a shinnery oak or sand sagebrush component are considered habitat for LPCs. Habitat vegetation exists across the historical range of the species, wherever rangeland has not been highly altered or converted to other uses. In the PPA, satellite imagery (along with some ground truthing) has been used to map the distribution of all vegetation types constituting suitable or potentially suitable habitat (see Landscape Analysis, above, and Conservation Strategy 2.1 below). Habitat suitability analysis and mapping also is ongoing in the Carlsbad area and portions of the Sparse and Scattered Population Area.

Plant community characteristics of suitable or potential LPC habitat can be described using the system of range-site classification developed by USDA/NRCS. The following NRCS Ecological Range Site categories vary slightly in plant composition, but share a common set of vegetative characteristics considered necessary for LPC habitat: Deep sand CP-2, SD-3 & Hp-3, sandhills CP-2, SD-3, & HP-3, sandy plains CP-2 & Hp-3, and loamy sand SD-3 & HP-3.

Standards for vegetation

The following standards for plant composition and grass height describe *high quality* habitat within the sand shinnery and sand sage - grassland ecosystems. Areas that fail to meet these

standards should not necessarily be considered unsuitable for LPCs. In some areas populations persist in habitat of poor or marginal quality, and these areas should be considered of great conservation importance. In these locations, survival and recruitment are likely to be increased if habitat conditions are improved to meet vegetative standards. In areas where populations have disappeared due to deterioration or elimination of high quality habitat, long-term recovery may be needed to meet habitat goals. In such areas, the focus of management should be on maintaining consistent progress towards meeting the vegetative standards.

- Quality LPC habitat should have an average canopy cover of 30-50% grasses, 25-40% shrubs, and 3-10% forbs; with no more than 42% bare ground and litter.

Standards for concealment cover

A site may provide suitable vegetative composition but lack the vertical structure required for successful nesting and concealment. A consistent method should be employed to assess the vertical structure of nesting cover across the range of the LPC. The technical committee recommends using the Robel pole visual obstruction technique (Robel et al. 1970). Sampling transects of pasture using the Robel method in the early spring (mid-February to early April), prior to the leafing out of shinnery oak and immediately prior to nesting, provides a standardized measure of the average height of residual grasses favored by LPCs for nest placement.

- The standard set by the technical committee is that at least 10% of all survey points should provide a Robel visual obstruction reading of at least 13 inches. (Note that by this standard, actual grass height will be something greater than 13 inches.)

Conservation Strategy 1.1: Conservative grazing management in important habitat areas, with compensation for ranchers

Description

This is a broad-scale strategy to ensure that grazing is maintained at a level consistent with the seasonal nesting and brood-rearing habitat requirements of the LPC, as defined by vegetative standards stated above. Ranch operators voluntarily participating in a compensation program would agree to try to meet these standards through the adoption of a suitable grazing program for their land or lease allotment. Such a program may involve an overall reduction in AUMs or acreage grazed, modification of fences and water sources, implementation of a more conservative, deferred or rotational grazing system that rests breeding areas in critical seasons to ensure adequate residual grass cover for nesting, and other related changes in management. *Support of the ranching community for this strategy is contingent upon the availability of adequate compensation and funding.*

LPCs nest during April and May, primarily in residual grass cover consisting of growth from the previous summer. Brood rearing usually occurs from April until late July. Thus, conservative grazing is necessary from August to June to provide quality nesting habitat, and on through July for brood rearing. (Bidwell et al. 2001, Giesen 1998, Riley et al. 1992). Vegetative standards should be specified in lease agreements, along with periodic monitoring and assessment over time to guide the application and refinement of the program until objectives are reached. The

precise grazing regimen that may be needed to achieve these standards may differ from location to location, and is best determined by ranch operators in consultation with agencies on a case-by-case basis.

In return for participating in the program, ranchers should receive fair compensation for costs stemming from reductions in AUMs or other changes in grazing practices undertaken to achieve LPC habitat improvement. The amount of compensation should be sufficient to form an adequate incentive for participation, and should be re-evaluated periodically. Environmental Quality Incentives Program (EQIP) funding estimates may be necessary for distinguishing reductions associated with LPC conservation from those that may be otherwise necessary due to drought conditions. Compensation should be available to include the entire ranch area affected by the change in management, regardless of land status.

Operators on private and state lands participating in such a program would be encouraged to enroll in a **Candidate Conservation Agreement with Assurances (CCAA)** with the FWS (see conservation strategy 3.4). A CCAA provides protection from any additional regulatory obligations or restrictions on non-federally-owned lands in the event of federal listing of a candidate species, such as the LPC or SDL. Under existing law guaranteed protections are not available prior to species listing on federally leased lands. However, the FWS can and should commit to honoring the terms agreed to in a CCAA across entire ranch operations containing a mix of private, state and federal lands. This can be facilitated if operators adjust the standard grazing plan for their allotment to reflect the terms of the CCAA. Should listing occur, formal protections can be extended through completion of a Safe Harbor agreement or Habitat Conservation Plan (HCP) with the FWS.

While a variety of compensation mechanisms may be employed (see "Funding", below) this strategy will be successful only if several conditions are met. It is important that management agencies including the BLM, NRCS, NMDGF and NMSLO assume responsibility not just for administering the incentives program, but also for providing or coordinating ranch management consultation to assist each participant in devising a suitable grazing regime, and to work with lessees and private landowners to improve habitat and meet vegetative standards. While the purpose of incentives is more conservative grazing, agreements should also address maintenance of fences, water sources, and other improvements. Implementation of this strategy should take into account any agency provisions regarding special management areas, such that all operations subject to formal restrictions on grazing also qualify for compensations.

Conservation benefits

Loss of high-quality habitat for nesting and raising chicks is thought to be a primary driver of LPC population declines. This effort will increase the extent of shinnery-oak and sand sage - grassland habitat that meets vegetative standards for successful nesting and brood-rearing, particularly in key areas, without imposing financial hardship on ranchers.

Evaluation

Success of grazing management practices for LPCs should be monitored and evaluated by annual counts of birds attending nearby leks, and if possible, counts of broods and chicks per brood in summer.

Project Area(s)

This strategy may apply in any areas of suitable or potentially suitable habitat. High priority locations for habitat improvement are areas where LPC populations are considered sparse and scattered and throughout the PPA.

Priority Assessment and Special Considerations

Highest priority. This strategy has the potential to improve LPC habitat and increase recruitment on a broad scale in New Mexico. The Working Group believes this should be a marquee initiative, and is one that can showcase the effectiveness of government-private party partnerships in carrying out habitat-based, incentive-driven species conservation.

This effort relies on the voluntary participation of ranchers. In implementing this strategy it is important to secure funding that is long-term, such that participants are protected from unexpected or abrupt termination. It is important to note that, while incentives are a key component of this strategy, conservative grazing also is in the long-term economic interests of ranchers. Such strategies can help maintain rangeland productivity through changing climatic conditions, and are consistent with stewardship responsibilities upheld by individual ranchers and the grazing industry in New Mexico.

Parties Responsible

BLM, NRCS, NMSLO, NMDGF, private parties. The Range Improvement Task Force may serve as conflict mediator. The Eastern Plains Conservation Coordinator (see Pathway 8) would help coordinate efforts among agencies and private parties. The NRCS, FWS, NMDGF and other agencies would help publicize the effort and inform ranchers about habitat and management needs of the LPC (see Pathway 7).

Parties Affected

Ranch operators and private landowners. Holders of BLM or NMSLO grazing leases. Possibly counties through reductions in tax revenues on livestock.

Funding

Funding for a compensation program may be provided by a number of different mechanisms. Several established federal- and state-sponsored funding programs provide support for habitat maintenance and improvement. These include Farm Bill programs such as the Environmental Quality Incentives Program (EQIP), the Wildlife Habitat Incentives Program (WHIP), the Grassland Reserve Program (GRP), and various wildlife habitat programs administered by the FWS or the NMDGF.

Of these, EQIP may be the program with the greatest capacity to provide compensation for conservative grazing management over a wide area. Three NRCS offices in New Mexico currently employ this program for LPC habitat management, including compensation for deferred grazing, infrastructure improvement, and habitat restoration. While in the past, EQIP has been limited to projects carried out on non-federal lands, program funding has recently become available in New Mexico for federal lands improvements. Such funding is essential for operators whose holdings include both private and public lands to fully participate in

recommended strategies for LPC habitat management. The Working Group strongly supports increased availability of EQIP funding, including the continued availability of funding for habitat improvements on federal grazing allotments in New Mexico.

On federal and state lands, incentive programs by surface management agencies are another primary means of carrying out this strategy. The NMSLO's Rangeland Stewardship Incentive Program (RSIP) offers a 25% reduction in grazing fees to qualifying lessees who voluntarily manage their operations to improve grass cover and range condition. Evaluations are made by a qualified range specialist at the outset of the agreement, and every five years thereafter. Lessees must apply through the SLO one year prior to lease renewal. BLM also has a program for non-use grazing permits, available on an annual basis when the primary objective of authorized grazing use or conservation use is the management of vegetation to meet resource objectives other than the production of livestock forage, to conduct scientific research or administrative studies, or to control noxious weeds.

On a larger scale, programmatic funding to support this strategy may become available through agency budgetary allocations or through a special funding mechanism approved by Congress or the New Mexico State Legislature. Additional information on current funding programs and strategies is available in Pathway 9.

Conservation Strategy 1.2: Enhanced CRP management

Description

Some lands enrolled in the USDA's Conservation Reserve Program (CRP) provide an important management opportunity for increasing and improving LPC habitat. Past management of CRP lands has favored planting of grasses that provide little habitat benefit for LPCs. This effort would redirect CRP management in strategic areas through mid-contract management by re-seeding an appropriate mix of primarily native species—including tallgrass and forb species important to LPC nesting and brood rearing—and through the limited use of managed grazing on CRP lands. (Management agencies also should consider possible use of non-native species that would provide suitable vegetative structure for LPC habitat, as exemplified by the recent successful use of alfalfa in habitat improvements on CRP in Kańsas.) Grazing on a limited basis (such as once every three years) would be used to stimulate the formation of desired vegetative structure within the CRP, and to provide forage in order to reduce pressure on other key habitat areas.

Most CRP contracts are for 10 years, and the implementation of a new management prescription is easiest when contracts are entered into or renewed. However, opportunities for mid-contract changes in management are allowed under the program. As part of this strategy, the Working Group recommends the development of mid-contract management guidelines for CRP lands in LPC habitat, such that habitat improvements can begin as soon as possible. The current Farm Bill also allows for exceptions to CRP acreage limitations, such that counties may be granted a special amount of additional acreage beyond the normal program maximum. The Working Group recommends that such an exception be pursued for counties currently at their CRP limit (25% of cropland), in order to create new areas of LPC habitat. This may be particularly

important in Roosevelt County, where CRP currently is at a maximum and where habitat losses due to agricultural development are continuing.

Critical to this strategy's success will be an administrative capacity and willingness to work within and/or modify existing CRP guidelines, in order to establish re-seeding and grazing programs designed for LPC habitat improvement. Equally critical will be a coordinated effort to build support and participation among private landowners already enrolled in, or potentially eligible for, CRP.

Conservation Benefits

This effort will help achieve vegetative standards for LPC habitat on private lands, and may help increase the total available area of suitable habitat. Under the proposed alternative CRP management practices, native grass and forb growth should increase on both CRP lands and, due to the availability of additional forage, on adjacent private rangelands. These changes will increase the quality and extent of LPC nesting and brood-rearing habitat, and provide additional food resources for the species. Local-scale habitat improvements achieved through this and other efforts will help restore connectivity between core and isolated LPC populations. In keeping with the overall mission of CRP, habitat improved and restored by this strategy may be expected to provide long-term benefits.

Evaluation

Success of CRP management for LPCs should be monitored and evaluated by annual counts of birds attending leks on or near affected lands.

Project Area(s)

CRP eligibility is limited to lands with a recent cropping history. CRP lands and croplands that may be affected by this effort are concentrated in the northern portion of the planning area, in east-central New Mexico. The primary focus should be on CRP lands within important habitat areas and areas of sparse and scattered populations. Implementation of this effort will occur on currently enrolled CRP fields, and on those that in the future may enter into CRP contracts. Roosevelt and Curry counties already contain their maximum allowable acreage in CRP.

Priority Assessment and Special Considerations

High priority. Enhanced CRP management may be a significant means of restoring LPC habitat on private lands. In such cases, landowners would be encouraged to seek enrollment in a Candidate Conservation Agreement with Assurances with the FWS (see Conservation Strategy 3.4). An emphasis should be placed on increasing the extent of CRP-eligible lands as permitted under the Farm Bill, and to establishing guidelines for making management changes on existing CRP contracts. On any CRP project undertaken in an area bordering Sand Dune Lizard habitat, consideration should be given to the needs of that special status species.

Parties Responsible

CRP is administered by the Farm Service Agency (FSA), with technical support from the NRCS. Assistance with coordination of landowner enrollment and conservation planning may be provided by NRCS staff and/or the Eastern Plains Conservation Coordinator (see Pathway 8).

Parties Affected

Private landowners who are eligible for CRP. Also, potentially, non-participating landowners who may not support LPC conservation efforts in their area.

Funding

CRP program funding, possibly leveraged with private cost-share funds.

Conservation Strategy 1.3: Mesquite control

Description

Mesquite encroachment into sand-shinnery and sand sage ecosystems reduces the amount of forage available for grazing, and creates habitat that is not suitable for LPC nesting or brood-rearing. Mesquite control may be used to improve rangeland health in areas not used by LPCs, thereby reducing pressure in nesting areas. This also can help offset forage losses due to initiation of conservative grazing on other ranch lands that are important LPC habitat. Thus, mesquite control is a valuable management tool from both a conservation and a livestock industry perspective.

This strategy calls for a program of mesquite reduction or eradication on rangelands containing or adjacent to LPC habitat. On federal land, BLM personnel would identify priority areas for control projects and carry out treatments in coordination with other interested agencies and permittees. On state lands, NMSLO staff, in cooperation with BLM, would work with lessees to secure funding and assist with treatments. Mesquite control on private lands would be undertaken at landowner initiative, with incentives provided by NRCS, and perhaps by NMDGF. Mechanical and chemical treatment would be used in accordance with NRCS standards and specifications for brush management. NRCS ecological site descriptions provide plant communities for sites based on soil type. Mesquite control may be carried out in concert with other efforts to enhance rangeland management for both grazing management and successful LPC recruitment.

While mesquite is here singled out as the predominant invasive shrub affecting the health and habitat quality of rangelands in southeast New Mexico, consideration also should be given to control of cholla or other invasive shrubs where such actions may increase rangeland productivity and alleviate pressure on LPC nesting and brood-rearing habitat.

Conservation Benefits

Mesquite eradication can improve overall watershed health by increasing grass production and water retention, and reducing the amount of bare ground. LPCs would benefit from the presence of additional forage, which allows the redistribution of livestock away from areas of sensitive nesting habitat and brood-rearing habitat. Where mesquite is eliminated, renewed plant succession may lead to a return of native shinnery oak, sand sagebrush, tallgrass species and forbs, allowing LPC range expansion into currently unoccupied and unsuitable habitat areas.

Evaluation

Vegetative response in treated and untreated areas should be carefully monitored using standard protocols. Where applicable, LPC response should be monitored and evaluated by

annual counts of birds attending leks on or near affected lands, and by conducting brood counts in summer where and when possible.

Project Area(s)

Mesquite control should occur in all areas of shinnery oak and sand sage habitat where encroachment is occurring, throughout the occupied range of the LPC in New Mexico. A high priority for this and other habitat improvement projects should be areas where LPC populations are sparse and scattered. Control may be beneficial in any part of the historic range where mesquite invasion has accompanied surface disturbance, and in areas where the shrub is visually intrusive.

Priority Assessment and Special Considerations

High priority. Where needed, mesquite control may be a simple and effective means of providing forage in areas less favored by LPCs, and of improving or adding to potential habitat areas for population expansion. On private lands, mesquite control may be part of a CCAA between the landowner and the FWS (see Conservation Strategy 3.4).

Parties Responsible

Primary responsibility will be with the surface management entity: BLM, NMSLO, or private landowners. Each should seek assistance and technical support from NMDGF and NRCS.

Parties Affected

Private landowners and holders of state or federal grazing leases.

Funding

EQIP and other Farm Bill funding is available for mesquite control as part of habitat improvement. BLM Rangeland Improvement Funds may be available for projects on federal lands. The NMSLO contributes survey and monitoring efforts in federal partnership programs (such as EQIP) affecting state lands. See Pathway 9 for a description of potential funding sources.

Conservation Strategy 1.4: Shinnery oak management

Description

Herbicides and defoliants sometimes are used to reduce shinnery oak cover and increase forage production. The effects of this practice on LPC habitat may be highly variable, depending on the manner and extent of treatment. Shinnery oak is a critical component of LPC habitat in much of southeastern New Mexico, providing both escape cover and a winter food source (Riley et al. 1992, Giessen 1998). Past widespread application of herbicides such as Tebuthiuron has eliminated shinnery oak over large areas, resulting in extensive loss of habitat. Removal of shinnery oak may destabilize fragile soils in dune areas, negatively affecting both SDL populations and livestock forage production. Shinnery oak does not recover in areas from which it has been completely eradicated. Since almost all shinnery oak reproduction is vegetative (suckering from existing plants), eradication is permanent.

In some locations, however, competition from shinnery oak impedes restoration of grasses and forbs needed for LPC nesting and brood rearing. When this occurs, limited use of chemical treatment can help achieve vegetative standards for quality habitat (see "Definitions and standards," Pathway 1 above). The technical committee of the Working Group has issued the following guidelines for chemical treatment of shinnery oak. Adherence to these guidelines should be emphasized as part of the overall rangeland management strategy for LPC habitat.

- Spraying with herbicides is recommended only when habitat goals cannot be achieved by other means, such as grazing system management.
- Given the condition stated above, treatment of shinnery oak is recommended when necessary to achieve vegetative standards for plant composition and canopy cover—for example, when shinnery oak cover still exceeds guidelines after grazing management has been applied.
- In conducting such treatments, the goal should be to temporarily reduce shinnery oak competition with grasses, allowing grass cover to increase naturally. Herbicides should be used at dosages that will set back (defoliate) shinnery oak, not kill it.
- Large block and linear spraying should be avoided. Instead, application should follow natural patterns on the landscape such that only patches needing treatment are treated.
- Herbicide treatment should never be applied in dune areas and corridors between dune complexes. (See conservation recommendations for the SDL, Chapter 5).
- Herbicide treatment should not be applied around large oak motts, and within 1.5 miles of active lek sites where LPC numbers are large or increasing.
- Post-treatment grazing management is essential to success. Grazing should be deferred for at least two growing seasons after treatment. Grazing after that time may be allowed only if progress towards meeting vegetative standards is being made. Longer periods of rest may be required in some cases, especially during drought conditions.

Conservation Benefits

When carried out on a limited basis as specified in the treatment guidelines above, shinnery oak control may help increase tallgrass cover associated with high quality habitat and LPC nesting success.

Evaluation

Vegetative response in treated areas should be monitored closely relative to guidelines for vegetation. LPC response should be monitored and evaluated by annual counts of birds attending leks on or near affected lands, and by annual brood counts in summer. Although the technical committee predicts that benefits will accrue if control is applied following the guidelines above, there has been no published research demonstrating benefits to LPCs from shinnery oak control. For this reason, careful monitoring of leks and recruitment is essential.

Project Area(s)

This strategy applies only in areas of LPC habitat where dense stands of shinnery oak occur, with the exceptions noted in the treatment guidelines above.

Priority Assessment and Special Considerations

This is not a high priority as a broad-scale strategy, but may be important in some local areas. Care must be taken on the part of management agencies and private landowners in carrying out shinnery oak treatment as a conservation or habitat improvement strategy. Failure to follow treatment guidelines may result in loss of habitat, or decreased habitat quality.

Parties Responsible

Primary responsibility will be with the surface management entity: BLM, NMSLO, or private landowners. Each should seek assistance and technical support from NMDGF and NRCS.

Parties Affected

Private landowners and holders of state or federal grazing leases.

Funding

Projects on private lands may be funded by the property owner. Funding for specific projects on private or state lands may be available through one or more NRCS programs. See Pathway 8 for a description of potential funding sources.

Pathway 2: Minimize habitat loss and modification due to energy development

- Conservation Strategy 2.1: Recommended guidelines for new mineral leasing
- Conservation Strategy 2.2: Minimizing impacts of new and ongoing energy development
- Conservation Strategy 2.3: Coordinating restoration and reclamation of previously developed areas

Pathway overview: Opportunities and challenges

Pathway 1 presented strategies for maintaining or improving LPC habitat on undeveloped rangelands. This pathway addresses development issues that pose a threat to LPCs by reducing the quantity or quality of suitable rangeland habitat in New Mexico. One existing development "footprint" in LPC habitat is from the oil and gas industry, due to its long history and economic importance in southeast New Mexico. For this reason, strategies in this pathway primarily focus on achieving a necessary balance between the needs of industry and the needs of species conservation.

Recommendations presented here are the result of lengthy negotiations, through which all parties came to better understand the various biological, economic, and management constraints pertaining to LPC conservation in areas of active mineral leasing and development. Through this process, key issues were identified and informed compromise proposals were developed by all sides. In the end the group was able to reach consensus around sets of broad recommendations for agency management and industry participation, designed to achieve long-term, productive coexistence between the oil and gas industry and the LPC.

Opportunities and challenges associated with oil and gas development differ across the planning area. The Working Group has taken a regional approach to management issues, with different sets of recommendations pertaining to the Primary Population Area (PPA), the sparse and scattered population areas (SSPA), and the isolated population area (IPA) or "Carlsbad area" (see Map 3 and section 4.2, "Planning regions and management priorities based on population status.") This regional approach is particularly important in conservation strategy 2.1, which presents sets of recommended guidelines for mineral leasing and development for each of the three planning areas. Strategies for minimizing impacts of new and existing development (conservation strategy 2.2), and recommendations for restoring and reclaiming previously disturbed areas (conservation strategy 2.3), may apply more broadly across the range of the LPC.

Over 90 percent of New Mexico's remaining LPC population occurs in the PPA, making it of vital importance to species conservation. Oil and gas activity here is increasing in some locations, but is generally not on a scale comparable to that of the Carlsbad region further south. This central region contains most of the NMDGF Prairie Chicken Areas, and most of the Roswell BLM's LPC Core Management Area. Populations are considered well-distributed and secure, demonstrating that coexistence between LPCs and a moderate level of development is a real possibility. However, a considerable portion of undeveloped habitat in the PPA has been leased for development, and regulatory options are limited once leasing has occurred. Habitat loss is also occurring in the eastern portion of the region due to the conversion of native rangeland to irrigated agricultural fields. The challenges for this region are to secure and build upon the healthy populations already present, ensuring that adequate species protections are established, while providing incentives to industry to participate in conservation and habitat restoration activities and allowing development to proceed outside of important LPC habitat.

Sparse and scattered population areas include LPC range north of the PPA, as well as isolated segments in southeast Chaves County. Maintaining and increasing LPC populations and habitat in this region is considered to be of highest conservation importance. Although the southern segments fall within the BLM Roswell Core Management Area, this region as a whole contains a high percentage of private lands, over which management agencies exercise almost no authority. It also has the least amount of oil and gas development activity of the three management regions. In this setting, conservation must rely heavily on efforts to reach out to, and enlist the support of private landowners. At the same time, policies must be in place to safeguard leks from development disturbance whenever and wherever possible.

Perhaps the greatest development-related challenges exist in the IPA/Carlsbad region, where oil and gas activity is more extensive. In 2003, a single known active lek remained in this area, near Eunice. Recovery of LPC populations in southeastern New Mexico is complicated by the high degree of habitat fragmentation and loss, compounded by several recent years of drought. However, scattered sightings of LPCs are still reported in various locations in IPA, and recent landscape analysis has identified a number of (mostly small) areas that may provide suitable habitat for nesting, brood-rearing, foraging and dispersal. These areas are considered crucial to the future recovery of the LPC in the Carlsbad region, and may be locations for habitat restoration and eventual species reintroduction efforts.

Definitions and standards

Recommendations in this pathway are based on the following understandings.

Areas Defined
(Also see Map 3, "LPC management regions based on population status")

1. The PPA includes the entire region where LPC populations are considered "well-distributed". It includes the portions of New Mexico Townships 6, 7, 8, 9, and 10 that fall between the Texas border and the western edge of Range 30 east. In addition to this large rectangular area, the PPA includes four additional Townships: 9 South 29 East, 6 South 29 East, 5 South 29 East, and 5 South 28 East.

2. To avoid confusion, it should be understood that embedded within the PPA is most of the Roswell Core Management Area (CMA). (The CMA also extends south of Township 10, into a region where LPC populations are considered sparse and scattered.)

3. Sparse and scattered population areas (SSPA) include lands north of New Mexico Township 6 (with the exception noted above), and also lands south of U.S. Highway 380 in southeast Chaves County.

4. Isolated population areas (IPA, "the Carlsbad area") include lands south of New Mexico Township 10 in Lea and Eddy counties, (with the exception noted above.)

Quantifying Development Impacts

As discussed in Chapter 3, recent research has documented behavioral avoidance by nesting LPCs of roads and various forms of infrastructure that may exist in rangeland habitat. R. J. Robel and colleagues calculated mean avoidance distances of nesting LPCs to different anthropogenic features in Kansas (Robel et al. 2004). The Working Group has adopted, with some modifications, these "Robel impact distances" in mapping and calculating the extent of habitat available to LPCs in a given area. Distances used in the calculation of habitat impacts surrounding different development features are as follows:

Oil or gas wellheads	.1 mile	(modified, after Robel et al.)
Sand/dirt 2-track roads, spur roads	0	(group recommendation)
Caliche roads, oil field access roads	.1 mile	(group recommendation)
Paved roads	.5 mile	(after Robel et al.)
Compressor stations	.75 mile	(modified, after Robel et al.)
Houses	.5 mile	(modified, after Robel et al.)
Power lines	.25 mile	(after Robel et al.)
Center-pivot fields	.25 mile	(after Robel et al.)

Habitat Categories

A detailed vegetation map of the PPA has been prepared by the New Mexico Heritage Program and the Earth Data Analysis Center at the University of New Mexico, based on satellite data and ground-truthing. The satellite coverage is very sensitive to differences in vegetative composition and even grass height, and so provides a snapshot of habitat conditions at any given time. The map identifies a number of vegetation types containing shinnery oak that are considered essential habitat for LPCs. The map also includes infrastructure such as active wells and improved roads, and plots LPC avoidance areas around these based on the data provided by Robel et al., as modified by the Working Group.

For planning purposes, a simplified version of the vegetation map has been created that divides all lands in the PPA into one of four categories, as defined below. This map accompanies and should be considered part of the set of guidelines presented here. A small-scale version of the habitat map is included as Map 4.

Occupied habitat. All areas within 1.5 miles of an active LPC lek site, regardless of vegetation (see definition of active lek site, below.) Upon discovery of a previously unknown active lek site, the surrounding 1.5-mile radius circle is considered occupied habitat. This includes approximately 50 percent of the PPA.

Suitable habitat. Unoccupied areas of appropriate vegetation type, in patches of 320 acres or more, falling entirely outside of Robel impact/avoidance distances around infrastructure. This includes approximately 16 percent of the PPA.

Potentially suitable habitat. Unoccupied areas of appropriate vegetation type, but in patches of less than 320 acres and/or falling within Robel impact/avoidance distances around infrastructure. This includes approximately 7 percent of the PPA.

Unsuitable habitat. Areas outside of appropriate vegetation. This may include urban and agricultural areas, areas where shinnery oak is naturally not present or has been eliminated by chemical treatment, and other areas where natural vegetation has been greatly altered or degraded. This includes approximately 27 percent of the PPA.

Definition of an active lek site. A lek is considered active when, with sufficient annual surveys, two or more males have been seen strutting during the mating season at least one year out of the last five.

The four habitat categories were adopted specifically for the mineral leasing guidelines for the PPA in conservation strategy 2.1, but may be usefully applied elsewhere. The specification of a 320 acre minimum patch size for suitable habitat was chosen based on the recommendations of experts within the Working Group. It represents a fragmentation threshold, beyond which lands may be largely unusable as habitat by LPCs. It should not be taken for or confused with an estimation of the area required for the survival of a LPC lek or population.

The most recent peer-reviewed scientific studies should be used to revise any of the definitions or management recommendations in this Pathway.

Conservation Strategy 2.1: Recommended guidelines for new mineral leasing

After lengthy negotiations, in which many different issues and policy options were brought forth and considered, the Working Group has agreed to a set of recommendations regarding the leasing of state and federal minerals in the three planning regions. The intent of these proposed guidelines is to bring about and maintain a productive coexistence between the LPC and the oil and gas industry. For the LPC, this means that adequate protections are provided to prevent further loss of populations or suitable habitat, and that mechanisms for increasing populations and suitable habitat are in place. For industry, the guidelines are structured to minimize any disruption to economic activities in areas not considered essential to LPCs, to encourage habitat reclamation, and to reward successful recovery of LPC populations.

This section departs from the format adopted for the conservation strategies in Pathway One. A numbered series of recommended guidelines will be presented separately for each of the three planning regions. In each case these will be followed by some explanatory text to clarify the thinking and intention of the Working Group in making its proposals. The reader should keep in mind and/or refer to the information presented in the previous section, "Definitions and Standards."

I. Recommendations regarding the Roswell Core Management Area

1. In the Roswell Core Management Area (CMA), the Working Group recommends that existing management policies shall be maintained. There shall continue to be no new leasing in this area, with certain exceptions granted on a limited, case-by-case basis when indicated due to presence of existing infrastructure, or as needed for unitization and drainage purposes, or for parcels a minimum of one mile from suitable habitat.

2. The group recommends that the BLM reevaluate the boundaries of the CMA, expanding or reducing where appropriate based on the habitat analysis.

II. Recommended Guidelines for New Oil and Gas Leasing in the PPA

NOTE: While most of the Working Group agrees that the following set of recommendations for the PPA represents the best proposed strategy at this time, individual companies, conservation organizations, local governments, and individuals reserve the right to submit concerns and objections, and to make suggestions on their own to strengthen the plan or address particular development or conservation concerns.

1. All recommended guidelines in this section apply to lands within PPA *outside of and excluding* the CMA, which is treated above. However, as an exception to this general provision, it is recommended that the separate, easternmost rectangular section of the CMA be managed under the guidelines here proposed here for the PPA. This

recommendation applies only to the oil and gas guidelines and does not otherwise affect the boundaries or management of the CMA.

Leasing recommendations for habitat categories in the PPA

2. The group recommends that areas designated as **unsuitable habitat** be open for new leasing, with no new or additional restrictions, unless such habitat occurs inside a state Prairie Chicken Area (PCA) or is affected as described in item 4 below.

3. The group recommends that *most but not all* areas designated as **potentially suitable habitat** be open for new leasing. BLM may choose to defer leasing, or lease with stipulations, in some areas which, by virtue of their size, location with respect to other habitat, and existing conditions, are considered priority areas for habitat restoration. These will generally be areas where development impact is minimal and transformation to suitable habitat is feasible, particularly where such improvement can help "block up" larger surrounding areas of suitable habitat.

4. Additionally, in keeping with the definitions and item 5 below, leasing may be deferred or stipulated in certain instances where development in **unsuitable** or **potentially suitable habitat** would extend an impact/avoidance zone into **suitable habitat**. Such exceptions to the general rule for unsuitable and potentially suitable habitat will be identified and discussed in the ongoing management conversation between the BLM and industry.

5. In areas designated as **suitable habitat** or as **occupied habitat**, the group recommends deferring new leasing with surface occupancy of federal minerals, or leasing with stipulations, pending achievement of the appropriate criterion specified in 8 or 9 below, or leasing with stipulations that would achieve the same criteria. Certain exceptions may be granted on a limited, case-by-case basis when indicated due to presence of existing infrastructure, or as needed for unitization and drainage purposes. Note—Industry has strong reservations that this rule may not achieve intended benefits.

6. The group recommends that the SLO continue current management practices of new lease deferral in occupied habitat.

7. In state **Prairie-Chicken Areas** (PCAs), the group recommends no new leasing of Federal minerals with surface occupancy. Leasing with a No Surface Occupancy stipulation may be allowed, where this is determined to be appropriate. Note that guidelines for lifting lease deferment below do not apply to the PCAs. The group also recommends that the NMDGF seek to acquire mineral rights for the PCAs—see Conservation Strategy 3.3.

Criteria for lifting of lease deferment in suitable and occupied habitat in the PPA

8. The group recommends that new leasing in **suitable** habitat would again be allowed if, by annual re-calculation, there is demonstrated a net increase in the sum of suitable and occupied habitat in the PPA. Lease deferment would be lifted for an area equal to the area of increase. (See further details under "Monitoring and administration," below.)

9. The group recommends that new leasing in **occupied** habitat would be again allowed if the above criterion for suitable habitat is met, AND there is a statistically significant LPC population increase statewide over the previous five years. (See further details under "Monitoring and administration," below.)

10. In 8 and 9 above, it is understood that across the PPA, the sum of suitable and occupied habitat area may increase or decrease for a variety of reasons, including habitat reclamation efforts, changes in rangeland management, changing climatic conditions, lek establishment outside of suitable habitat, new mineral development, and agricultural conversion of rangeland. Thus the general equation for calculating changes in suitable habitat (factoring in Robel impact areas in both gains and losses) is:

Suitable habitat acres gained (by reclamation, range improvement, etc.)
\- Suitable habitat acres lost (due to agriculture, new development, range declines, etc.)
= Net change in suitable habitat

Note that lifting of lease deferment is not contingent upon the reason for an increase, only that an overall net increase has occurred. On the other hand, reclamation projects alone are not automatically rewarded by a lifting of lease deferment, if conditions overall are declining. The logic of this arrangement is to ensure that a bottom-line standard of habitat protection is maintained, while rewarding overall success in improving conditions for LPCs.

11. The above guidelines pertain only to new leasing. The right of industry to develop existing leases is recognized and affirmed. It is understood that Negotiated Plans of Development (PODs) and Conditions of Approval may be employed to guide orderly development on any new federal leases in potential, suitable, or occupied habitat, and on existing federal leases in such habitat. BLM should also explore options for imposing more stringent management on existing leases, in cases of need. (See Conservation Strategy 2.2, "Minimizing impacts of new and ongoing development" for further recommendations regarding existing leases and ongoing development.)

Monitoring and administration

It is recognized that the proposed guidelines can only function as intended if there is a mechanism for accurate and up-to-date accounting of changes in surface conditions and LPC populations in the PPA. To achieve habitat accounting, two complementary and overlapping mechanisms are proposed: periodic updates of the PPA habitat map, and ongoing tracking and accounting of habitat reclamation/restoration efforts.

12. **Updating the PPA habitat map**. Before the guidelines go into effect, the baseline map must be completed in a manner satisfactory to all parties. Once the baseline map is established and agreed to, area totals for the four land categories will change only as a result of changing habitat conditions (and not simply as a result of further refinements to the map or the data used to generate it.)

Satellite reflectance data for vegetation are available any time. For the purpose of tracking changes in surface conditions in the PPA, a new map update should be completed annually. Updates at different intervals may occur upon agreement of the parties and availability of funding. Map updates should be coordinated through and funded by the agencies.

In addition to changes in vegetation, map updates will incorporate all known changes in roads and infrastructure during the time interval. Associated impact/avoidance areas (see Definitions and Standards, above) will be plotted or deleted as needed.

13. **Tracking and crediting habitat reclamation.** It is important that all improvements in LPC habitat be captured in the periodic map updates and the recalculation of land area falling into the four categories. As a supplement and cross-check to the satellite mapping, there shall be an information clearing house for reporting and tracking of reclamation/restoration projects, as well as new development or other habitat losses, with oversight by both agency and industry representatives. Information maintained by this clearing-house, or by other ground-truthing, can be used to refine or override the satellite mapping.

If an area formerly classified as unsuitable or potentially suitable is reclassified as suitable, according to an updated satellite analysis, it will automatically be counted as such in the new area calculation. However, as noted above, an area where reclamation is under way may also be reclassified as suitable if criteria stated below are met—regardless of the satellite analysis.

The criteria below, for counting reclaimed areas as suitable habitat, do not describe the final goal of reclamation or habitat improvement projects generally, which is to create quality habitat for LPC nesting and brood-rearing (see Definitions and Standards, Pathway One). Rather, for the purpose of the area calculation, the criteria are intended to allow credit for reclamation work that has been carried out and that shows initial signs of success, prior to the full development of vegetative cover. This is a compromise between the divergent positions that credit for reclamation should come either immediately upon completion of the work, or not until vegetative standards have been met.

For the purpose of the area calculation described in point 8 above, a previously developed area may be reclassified as suitable habitat:

- If roads have been closed or removed and structures have been removed, according to applicable agency standards and guidelines, such that the area is no longer affected by any Robel impact/avoidance zone; and
- If appropriate vegetative structure is not already present, initial reclamation has been conducted to appropriate BLM standards.

Further specification of recommended practices for reclamation of developed areas is provided in Conservation Strategy 2.3.

Rangeland management strategies described in Pathway One (such as mesquite removal) may also result in the establishment of new areas of suitable habitat. Since these involve direct changes to the structure and composition of vegetation, the results should be immediately apparent in the satellite analysis.

14. **Tracking occupied habitat.** Management of mineral leasing according to the guidelines proposed here requires that there be complete data sharing among all parties, such that all known lek sites are accounted for on the baseline map. At the same time, appropriate care must be taken not to make precise locations on private land publicly available, without landowner consent.

Occupied habitat may increase or decrease with the discovery or disappearance of active leks (see "Definitions and standards," above) in the PPA, regardless of vegetation. In some areas, increased survey effort may reveal existing lek locations that are not currently known. Note that since federal leasing is deferred in both suitable and occupied, the discovery of new leks in suitable habitat areas would not affect the overall calculation of habitat.

15. **Tracking population trends**. As stated in 7 above, new leasing in occupied habitat is contingent upon a positive, statistically significant population trend for LPCs statewide over the previous five years. Advice from a consulting statistician is being sought in order to determine the level of sampling needed to achieve significance, and to help decide what percent increase is a reasonable standard.

16. The final calculation of area added to or subtracted from each of the four land categories will take place after the map update and all subsequent adjustments have been completed and agreed to. If there has been an increase in the sum of suitable and occupied habitat, lease deferment can be lifted in an area of suitable habitat in the PPA equal to the area of increase. Locations where deferment is to be lifted will be determined by a mixed advisory panel and/or through industry-agency negotiation. Industry will have the opportunity to request that specific areas be opened to leasing.

III. Recommended Guidelines for New Oil and Gas Leasing in the Sparse and Scattered Population Areas (SSPA)

1. In occupied habitat in the SSPA, the group recommends that the SLO maintain its policy of deferring new leasing with surface occupancy of state minerals.

2. In occupied habitat in the SSPA the group recommends deferring new leasing with surface occupancy of federal minerals. Federal leasing with a No Surface Occupancy (NSO) stipulation may be allowed, where this is determined to be appropriate.

3. The above deferments would remain in place pending realization of criteria to be determined. Future leasing in occupied habitat would be linked to the status of the species

and/or habitat in New Mexico, as identified in the annual FWS candidate notice of review and/or other periodic agency review.

4. It is also recommended in Conservation Strategy 3.2 that two new areas or combinations of areas that can function as LPC reserves be established in the northern SSPA. These should be located within predominantly suitable habitat areas that are large enough to support viable LPC populations and meet other criteria specified in Conservation Strategy 3.2. Once established, further leasing with surface occupancy would be deferred in reserve areas.

5. The right of industry to develop existing leases is recognized and affirmed. It is understood that Negotiated Plans of Development (PODs) and Conditions of Approval may be employed to guide orderly development on any new federal leases in potential, suitable, or occupied habitat, and on existing federal leases in such habitat. (See Conservation Strategy 2.2, "Minimizing impacts of new and ongoing development" for further recommendations regarding existing leases and ongoing development.)

6. It is important that agencies work together and that all affected parties be kept fully informed regarding lek status and locations (while respecting confidentiality concerns of private parties), and regarding when and where lease deferments due to occupied habitat will be implemented. Agencies should strive to keep all land owners and users informed regarding LPC conservation needs and measures generally, and work with industry to help encourage and carry out practices for minimizing development impacts in occupied or other sensitive habitat areas. See also Conservation Strategy 2.2 below.

IV. Recommended Guidelines for New Oil and Gas Leasing in the Isolated Population Area (IPA) / "Carlsbad Area"

1. In occupied habitat in the IPA /Carlsbad area the group recommends deferring new leasing with surface occupancy of federal minerals. Federal leasing with a No Surface Occupancy (NSO) stipulation may be allowed, where this is determined to be appropriate. (Note this recommendation would currently apply only to a single known active lek.)

2. The group recommends that further habitat suitability analysis be conducted in the IPA, focusing on the 17 areas previously identified by the Carlsbad Field Office as having habitat that may be of value to LPC recovery, and on areas where LPCs have recently been sighted. This analysis should be completed by January 1, 2007, or sooner. Agencies and industry should work together to expedite the habitat analysis, and to ensure that sufficient manpower and resources are available to meet the target deadline.

Focus areas should be prioritized for reclamation potential, and for potential to maintain re-established LPC populations over time. An advisory committee of stakeholder representatives should be formed to work with and offer input to BLM regarding prioritization of areas, and subsequent management recommendations. Areas determined

to be lacking high conservation value should be eliminated from further consideration for special management.

BLM should pursue a range of options to maintain habitat value in areas determined to be of high conservation importance. These options include guided development on existing leases through the use of PODs and voluntary agreements (as described in Conservation Strategy 2.2,) lease stipulations, deferral of new leasing in areas determined to have value for LPC recovery, and other strategies. Management approaches will be determined and pursued as appropriate, on a case-by-case basis. Note that some areas that may be important to LPC recovery may already be receiving management protection under guidelines adopted for the Sand Dune Lizard. Strategies for population recovery in the Carlsbad area are further elaborated in Conservation Strategy 4.1, "Identify, manage and restore potential habitat areas in southeast New Mexico."

3. Any lease deferments as described above would remain in place pending realization of criteria to be determined. Future leasing in occupied or other protected habitat would be linked to the status of the species and/or habitat, as identified in the annual FWS candidate notice of review and other periodic review.

4. Additionally, it is recommended in Conservation Strategy 3.2 that two new areas or combinations of areas that can function as LPC reserves and sites for LPC reintroduction be established in the IPA/Carlsbad area. These should be located within predominantly suitable habitat areas large enough to support viable LPC populations and meet other criteria specified in Conservation Strategy 3.2. It is recommended that the WIPP site serve as the location of one such reserve (see Conservation Strategy 4.2). Potash enclaves and private lands that may be available from willing sellers should be considered as a second possible reserve location. Once established, further leasing with surface occupancy would be deferred in reserve areas.

5. The right of industry to develop existing leases is recognized and affirmed. It is understood that Negotiated Plans of Development (PODs) and Conditions of Approval may be employed to guide orderly development on any federal leases in potential, suitable, or occupied habitat. See also Conservation Strategy 2.2, "Minimizing impacts of new and ongoing development" for further recommendations regarding existing leases and ongoing development.

6. It is important that agencies work together and that all affected parties be kept fully informed regarding lek status and locations (while respecting confidentiality concerns of private parties), and regarding when and where lease deferments will be implemented. Agencies should strive to keep all land owners and users informed regarding LPC conservation needs and measures generally, and work with industry to help encourage and carry out practices for minimizing development impacts in occupied or other sensitive habitat areas. See also Conservation Strategy 2.2 below.

Conservation Strategy 2.2: Minimizing impacts of new and ongoing energy development

Under the guidelines presented above in Conservation Strategy 2.1, new mineral leasing and development will continue in most areas outside of suitable and occupied habitat in the PPA, and outside of occupied habitat and reserve areas in the SSPA and the IPA. In all three regions, new development may continue in suitable and occupied habitat areas for which state or federal mineral leases have already been obtained. Where and how this new development proceeds may affect both future leasing opportunities and the future status of the LPC in New Mexico. The Working Group recognizes that, once a valid mineral lease has been purchased, development of that lease cannot be precluded by regulatory means. However, development impacts can be greatly minimized through the establishment of negotiated guidelines and variety of mitigation strategies.

Management of existing leases

In all three planning regions, the group acknowledges that the BLM may employ negotiated Conditions of Approval (COAs) and Plans of Development (PODs) for existing federal mineral leases, to help ensure orderly development with a minimum of surface impact in LPC habitat. The group recommends that these requirements should not be used to prevent development from moving forward at a reasonable pace. BLM should also explore options for imposing more stringent management on existing leases, in cases of need.

Included in COAs and PODs may be specification of various strategies for minimizing impacts associated with new development, and for reclaiming developed areas, as discussed more generally below.

In all three planning regions timing and noise stipulations, such as are currently in place on federal mineral leases in LPC areas, should be maintained only as needed. These stipulations are intended to prevent disruption of LPC leking and nesting by activities associated with energy exploration and development. Stipulations should be imposed only in areas where LPCs are present, as indicated by sightings or survey reports within a period of 2 years. Exceptions may be granted on a case by case basis. In areas where adequate surveys over two years have not detected LPCs, stipulations should be waived. They should be re-applied if LPCs reappear.

Mitigating development impacts

In areas that have already been leased, including suitable and occupied habitat, development may proceed at the discretion of the lease holder, in consultation with BLM. In sensitive habitat areas or where existing LPC populations may be affected, the group recommends that lease holders consider various "least impact" options, including choosing to forego development until a later date and/or use of directional drilling to avoid surface disturbance. Suitable habitat so maintained will be reflected in the area calculation that determines when additional areas may be opened to leasing, as described in Conservation Strategy 2.1. It is acknowledged, however, that these options may not be preferred by industry and that new development in suitable and occupied habitat will sometimes occur.

Throughout the planning region, on both private and public lands, voluntary efforts are encouraged to limit new surface disturbance impacts in suitable and occupied habitat. This is particularly true in the northern portion of the SSPA, where most LPC habitat is on private land. Agencies should strive to keep oil and gas operators aware of LPC conservation issues and of the need for, and benefits of, such voluntary efforts. This should include provision of educational materials. Operators should be given guidance in how best to plan and carry out projects in a way that would minimize impacts on LPC populations and habitat.

A variety of techniques may be applied to reduce or mitigate impacts of oil and gas activities in active production areas, and to reclaim sites or facilities no longer in use. Targeted use of mitigation and reclamation techniques may yield significant benefits in areas where development is at a relatively low level, and where suitable or occupied habitat can be maintained by the strategic placement, co-location or consolidation of roads, structures, power lines, and other features or equipment. While infrastructure itself may not occupy a large amount of surface area, the suitable habitat that may be gained by infrastructure removal includes surrounding impact/avoidance zones (see Definitions and Standards, above). Thus there is a high rate of return, in habitat acres, for infrastructure removed or consolidated.

A number of specific actions may be taken to reduce fragmentation and development impacts in LPC habitat. Even in areas where economic activity is continuing, abandoned or unneeded roads, power lines, well pads, and other structures may be removed, and their sites reclaimed. In some locations, multiple roads serving separate drill sites operated by different companies may be replaced by a single, shared access road to a project area. The Working Group recommends that agency road policies be modified, such that exploration roads may be built to standards that result in less surface impact than roads built to standards for operations. (As noted in "Definitions and Standards," an impact/avoidance distance of .1 mile on either side is calculated for caliche roads, while no impact/avoidance area is calculated around sand/dirt two-track roads.)

Individual well plugging at the time of economic depletion should be encouraged, with site and access road reclamation to follow shortly thereafter. Companies should be encouraged to remove all structures from the site. If power poles are owned by a third party, industry should work with the owner to have them removed in a timely manner. Reclamation of production sites may involve caliche removal, disking and fertilization, and reclaiming with native species. The Working Group recommends that current BLM and New Mexico Oil Conservation Division (NMOCD) protocols and seed mixes for site reclamation should be evaluated and adjusted to better provide for the needs of the LPC. Reclamation should be carried out to establish an appropriate mixture of native grasses, forbs and shrubs, with a long-term goal of meeting vegetative standards. The following section, Conservation Strategy 2.3, also deals with reclamation and restoration, focusing on previously developed areas now out of production.

Conservation Strategy 2.3: Coordinating restoration and reclamation of previously developed areas

Long-term planning for increasing and/or restoring LPC populations in New Mexico should recognize the temporary nature of current development activities. Although mineral extraction

may occur on a given piece of land over a period of many years, eventually resources become exhausted and wells and related infrastructure are taken out of production. In some areas this has already occurred; elsewhere, some wells are nearing maturity and may be retired soon or within the next decade. This will create opportunities to increase suitable habitat, and to create or expand LPC management areas

In portions of the LPC's range in New Mexico, abandoned production sites with plugged wells remain from a previous era of development. These sites, which were never reclaimed to today's standards, provide an opportunity for broad-scale restoration that can increase the extent of suitable habitat. The BLM is currently proposing a broad-scale reclamation project for these "legacy" sites in LPC habitat in Eddy, Lea, Chaves, and Roosevelt counties. Pilot projects in the past year have focused on reclamation of abandoned well-pads and access roads, and re-contouring these sites with the surrounding landscape. The Working Group supports these efforts and recommends BLM, NMOCD, industry, and ranch operators continue to work together in planning and carrying out this large reclamation effort.

As part of a comprehensive recovery strategy it is important to address foreseeable changes in land uses over the long-term. Advance planning and site prioritization are needed in order to take full advantage of opportunities to increase and improve LPC habitat in New Mexico over a time frame extending beyond the next few years. These should be informed by the habitat suitability analysis and mapping described in "Landscape Analysis" earlier in this chapter and by other parallel efforts. The goal is a forward-looking approach by which retired and reclaimed oil field areas are gradually brought into an expanding network of lands managed for LPC habitat protection.

Reclamation of abandoned and out-of-production sites is a long-term strategy, directed towards managing the eventual transition from mineral extraction back to other land uses in a manner consistent with LPC and SDL conservation objectives. However, it must be pursued on an incremental basis, starting with site-specific mitigation strategies described in Conservation Strategy 2.2 and extending to larger areas. All such work should be closely monitored and credited, as described in Conservation Strategy 2.1. Special consideration is given to the IPA/Carlsbad area in Conservation Strategy 4.1. In this region, coordinated reclamation of retired oil fields may be extremely important over the long term as a means of reversing landscape fragmentation and facilitating the restoration of viable LPC populations to southeastern New Mexico.

An important consideration is that while eventual retirement of all active wells is a certainty, it is impossible to know precisely when production will end for a particular development or region. Retirement of certain areas from production may be affected by a number of factors, including current well productivity, economic considerations (such as the price of oil), and potential conservation benefits to be achieved. In addition, new technologies may in the future allow extraction of resources that cannot be reached or economically harvested by existing equipment, potentially prolonging the life of a production site.

Restoration and reclamation projects are generally carried out by the oil and gas industry, with guidance from, or according to standards set by, BLM on federal lands, NMOCD and NMSLO

on state lands, and possibly NRCS on private lands. Project evaluation should include accounting of projects undertaken and completed, vegetation monitoring relative to standards, and annual monitoring of leks on or near affected lands. Broad-scale reclamation may be the most publicly visible component of industry efforts to contribute to LPC conservation, and may have added significance for that reason.

Pathway 3: Consolidate and expand network of reserves and other areas managed for LPC conservation

- Conservation strategy 3.1: Land and mineral exchanges to consolidate federal holdings in BLM core management areas
- Conservation strategy 3.2: Options for acquiring or designating lands for LPC reserves
- Conservation strategy 3.3: Develop and implement a comprehensive management plan for the PCAs
- Conservation Strategy 3.4: Develop Candidate Conservation Agreements with Assurances (CCAAs) to promote conservation efforts on state and private lands

Pathway overview: Opportunities and challenges

Along with on-the-ground efforts to improve the quality of rangeland habitat (Pathway 1) and minimize development impacts (Pathway 2), there must be an effort to establish an adequate network of reserves and other lands managed for LPC conservation on a broad scale. Conservation of the species requires that some large blocks of native rangeland be protected and managed largely or exclusively as LPC habitat. These may occur in designated reserves or in other kinds of special management areas, or on large tracts of private land. Such protected areas should not be limited to regions where healthy LPC populations currently exist. Establishing reserve sites in the isolated and sparse-and-scattered population areas is particularly important, to prevent further fragmentation and to help maintain or re-establish habitat capable of supporting viable LPC populations in these regions. In addition to large reserves, it is also important that there be smaller blocks of land managed as LPC habitat distributed across the planning region. Protected areas of all kinds should form a broad network, linked wherever possible by habitat corridors to maintain or re-establish connectivity between populations.

The nucleus of such a network already exists, consisting of designated BLM core management areas, the PCA system maintained by NMDGF, and a few private holdings on which significant habitat restoration is taking place (see Map 3). While declines have occurred elsewhere, LPC populations have remained healthy in most of these protected areas. The Working Group has discussed various strategies for adding to and consolidating this network, in a manner that respects the rights and economic interests of property owners. Significant gains can be achieved through interagency land exchanges resulting in the consolidation of BLM holdings within that agency's LPC core management area. Such a strategy can protect essential habitat for species conservation while easing restrictions on energy development in other areas. Additional opportunities exist to establish new LPC reserve areas in key locations through designation of

federal lands, or by the acquisition of lands from willing sellers, or through the purchase of conservation easements. The potential to bring more state and private lands into some form of conservation management can be greatly increased by the development of a regional Candidate Conservation Agreement with Assurances (CCAA) between the FWS, state agencies, and private parties. It should be noted that the establishment of effective reserves or other protected areas should entail the subsurface mineral estate along with the surface area.

These strategies clearly go hand in hand with elements of the other conservation pathways. Efforts to improve local habitat quality and expand suitable habitat areas can help bring about and maintain conditions desired for special management areas, and form part of a broad network of lands managed with a commitment to LPC conservation.

Conservation Strategy 3.1: Land and mineral exchanges to consolidate federal holdings in BLM core management areas

Description

Efforts to manage large areas of land as LPC habitat are complicated by existing patterns of land ownership and management authority, and sometimes by conflicting agency policies and mandates. For example, BLM restrictions on mineral leasing in a designated area may not yield optimal conservation benefits if high levels of energy development occur on state lands nearby. Currently the Roswell BLM Field Office maintains a large LPC Core Management Area (CMA) composed of several discreet land segments, where no oil and gas leases have been issued since 1997. Areas to be included in Roswell CMA are currently under agency review. (See Working Group recommendation for changing boundaries of the Roswell CMA associated with recommended guidelines for mineral leasing, Conservation Strategy 2.1).

The Working Group recommends a coordinated pursuit of land exchanges between the BLM and the SLO in the Roswell Field Office, in order to expand the size and connectivity of the BLM-administered CMA that would be withheld from surface-disturbing activities. The strategy may provide benefits to the SDL, as well as the LPC. The BLM would acquire state lands and/or mineral rights within important areas of habitat for inclusion in its CMA. The SLO would acquire surface or mineral rights on federal lands considered less important for LPC or SDL conservation, and offer these for oil and gas leasing. The simplest transactions would involve state lands where minerals are currently unleased, but exchanges involving a third-party lessee are also possible. In such cases the buying back of leases from willing sellers may sometimes be required. Properties considered for exchange under this strategy should be located within the same county; those located within the same ranch operation are ideal, though such opportunities may be rare.

Critical to the success of this effort is a commitment on the part of both agencies to identify and actively pursue mutually beneficial exchanges that will yield conservation benefits. These efforts can be facilitated by support from the oil and gas industry. A successful land exchange effort will not only have to address minerals, but also have to take grazing leases into account and ensure no net economic losses to ranchers.

Conservation Benefits

This effort will help ensure that large blocks of contiguous habitat are maintained and managed for LPC and SDL conservation. Further fragmentation of habitat will be prevented. Important protection will be provided for areas that have not yet experienced significant impacts from energy development, but that may be subject to such impacts in the future. This strategy will help secure habitat both in areas where LPC populations are healthy and in areas where they are sparse and scattered. Land and mineral exchange is considered an optimal means of securing protected areas free of the complications that arise from a split surface - mineral estate.

Evaluation

Agencies should submit an annual program report to stakeholders describing progress in LPC habitat protection through federal-state land and mineral exchange.

Project Area(s)

This strategy applies to BLM and SLO-administered lands in the Roswell Field Office, including areas of east Chaves and southwest Roosevelt counties where LPC populations are considered healthy, and areas in southeast Chaves County (south of NM Highway 380) where LPC populations are considered sparse and scattered. Of highest priority is the acquisition of lands in the southern portion of the CMA where sparse and scattered populations currently exist. Several unleased tracts of state land in east and southeast Chaves County have been identified as possibilities for initial exchange negotiations.

Priority Assessment and Special Considerations

Highest priority. The Working Group considers land exchange to be an important strategy for protecting occupied LPC habitat from fragmentation and development, one which does not require a significant new source of funding. The strategy is supported in principle by all stakeholders and is seen as mutually beneficial from conservation and industry perspectives.

Parties responsible

BLM and NMSLO.

Parties affected

Private parties or companies holding or interested in acquiring federal or state mineral leases on lands considered for exchange. Holders of state or federal grazing permits may be affected by an exchange of surface ownership.

Funding

BLM and NMSLO will require additional budgetary and staff allocations to establish a land exchange program. Agencies may need to provide funding to buy back leases from willing sellers, if this is considered a viable option.

Conservation Strategy 3.2: Options for acquiring or designating lands for LPC reserves

Description

Where land exchanges are not possible, an alternative strategy is to secure and establish reserve areas, to be managed with a long-term commitment to maintaining quality LPC habitat. This effort closely parallels the previously described strategy of land exchange in its general purpose and objectives. Preventing further fragmentation of habitat and establishing new and expanded management areas for LPC conservation are considered top priorities for protecting the species.

Currently, lands within the PCA reserve network administered by NMDGF receive the greatest degree of habitat protection and management attention on the needs of LPCs, but most of the PCAs are fairly small. The Working Group believes that several larger but similarly protected reserves are needed in key areas. These need not necessarily be administered as PCAs or follow the PCA model. For example, in some areas it may be desirable to allow limited grazing, following guidelines and strategies described in Pathway 1. New reserves may be established through the purchase of private lands from willing sellers. Reserve status may also be established on private lands through the purchase of conservation easements or through long-term leases. Reserves on public lands may be managed as NMDGF Prairie Chicken Areas, as federal dedications such as BLM Special Management Areas or as commitments of other federal, state, or local governments. The key element is that necessary restrictions on use be upheld through a long-term commitment to maintaining quality LPC habitat.

Accordingly, the Working Group has made the following recommendations.

A **LPC reserve** is defined as an area of primarily sand shinnery or sand sage-grassland habitat in which activities detrimental to LPCs are *not allowed*, and where the land is managed specifically to optimize LPC habitat. Grazing, if any, must be very conservative. Petroleum development must be absent. Roads must be minimized. Controlled access for wildlife viewing may be acceptable. LPC reserves may be located on public or private lands.

LPC reserves should consist of *at least* 4 square miles (2560 acres) of contiguous habitat that is predominately shrub/grassland on sandy soils. It is desirable that the surrounding 12 square miles (7680 acres) be managed with major considerations for LPC habitat, through the various strategies described in Pathways 1 and 2.

A minimum of five new LPC reserves should be established within the next few years. New reserves are most needed where populations are already isolated or sparse and scattered. Accordingly, at least two LPC reserves should be established in the Isolated Population Area in Lea or Eddy counties; these will provide necessary habitat for proposed reintroductions in southeastern New Mexico. At least one LPC reserve should be established where populations are sparse and scattered in southeast Chaves County, south of Highway 380. At least two new LPC reserves should also be established where populations are sparse and scattered in north Roosevelt, Curry, and east De Baca counties.

Pursuit of this strategy will require ongoing interagency coordination in order to identify and prioritize potential reserve areas and protection mechanisms. Significant funding will also be needed, and this will likely require multiple sources. Conservation organizations have expressed

a willingness to participate in funding for new reserves. Work will be required to generate support and address the concerns of neighboring landowners and ranch operators.

This effort can and should also be pursued on a more opportunistic basis, as properties with high LPC habitat value come up for sale. In this regard, partnerships with private conservation organizations such as The Nature Conservancy may be important to carry out the acquisition of lands pending their eventual transfer to agency administration or ownership. An important consideration regarding final ownership of reserve areas purchased from private parties may be county requirements that specify no net loss of privately held lands.

Conservation Benefits

As with land exchanges, this effort can help block up and protect areas of important LPC habitat in important areas, protect isolated populations, and establish safe corridors for LPC dispersal and interchange among population units.

Project Area(s)

Several general areas have been identified as being highest priority for the establishment of new reserves—see recommendations above. Outside of these areas, any available lands containing important LPC habitat within historical range of the species in New Mexico may be considered for acquisition and management as protected areas.

Priority Assessment and Special Considerations

High priority. All efforts to enhance or increase habitat connectivity, and increase the total area in which priority is given to LPC management and conservation, are considered important steps to species protection in New Mexico. This effort should be coordinated with other strategies (land exchange, PCA management, CCAA protections on private lands) for placing important habitat areas under protective management. It is important to consider mineral issues when establishing LPC reserves— the acquisition of a surface area cannot guarantee protection if mineral rights remain under separate ownership.

Parties responsible

Potential involvement by BLM, NRCS, NMDGF, and private conservation organizations.

Parties affected

Private parties may be affected by participating in the sale of property or easements, or by the establishment of LPC reserve areas on neighboring properties.

Funding

Initial funding for some acquisitions may be provided by private conservation organizations. However, significant additional funding will likely be required. Possible sources include increased NMDGF budgetary allocations. See Pathway 8 for more information on funding mechanisms.

Conservation Strategy 3.3: Develop and implement a comprehensive management plan for the PCAs

Description

The PCA network maintained by NMDGF includes 29 relatively small areas managed primarily for LPCs, totaling roughly 24,000 acres. In a number of these areas, LPC populations have remained healthy and even shown increases in recent years. Along with other efforts to expand the network of protected areas, the PCA system may benefit from a comprehensive effort to improve and coordinate management to best maintain high quality LPC habitat.

A new management plan for the PCAs would emphasize a number of elements. Management priorities that might be articulated in a new PCA plan include:

- Addressing potential complications to long-term management stemming from federal and SLO ownership of mineral rights on PCAs. An exchange strategy such as described in Conservation Strategy 3.1 may be necessary to consolidate PCA estates.
- Greater focus on management of vegetation to achieve standards for nesting and brood-rearing habitat.
- Consideration of possible use of grass banks.
- Increased research on PCAs to improve knowledge of basic LPC biology and to test, on a limited basis, responses to different management techniques including limited grazing.
- Establishment of more precise management goals for the entire PCA system.
- Evaluation of PCA network effectiveness in meeting landscape-level needs of the LPC, including examination of possible network reconfiguration or consolidation.
- Acceleration of projects to survey and fence PCA units.
- Increased use of PCAs as a vehicle for public education and demonstration.
- Increased efforts to gain local landowner support for PCA objectives, and to work with landowners to extend habitat benefits beyond PCA boundaries.
- Increased funding for PCA staff, including a full-time PCA manager.

Conservation Benefits

PCAs are the only LPC reserves in New Mexico, and as such are vital to conservation efforts. This effort will help ensure their full potential and value is realized. Habitat quality on the reserves will be maintained or improved to benefit local LPC populations. Coordinated planning across individual units will help advance efforts to manage on a landscape scale and connect isolated populations. Research and outreach efforts will lead to improved LPC management on PCAs and in other areas.

Project Area(s)

Primarily east-central New Mexico. This strategy applies to all existing PCAs (see Map 2) and to any new PCAs that may be established.

Priority Assessment and Special Considerations

High priority. Making best use of the PCA reserve system is an important and logical starting point for protecting LPC populations in east-central New Mexico. It is important that PCAs not be over-utilized for research and demonstration projects, to a degree that may interfere

with their primary function of protecting LPCs. Such projects should be prioritized and applied with caution.

Parties responsible

NMDGF is responsible for the PCAs.

Parties affected

Potentially, neighboring landowners.

Funding

State program funds made available to NMDGF for PCA management.

Conservation Strategy 3.4: Develop Candidate Conservation Agreements with Assurances (CCAAs) to promote conservation efforts on state and private lands

Description

Candidate Conservation Agreements with Assurances (CCAAs) are formal agreements under the Endangered Species Act between the FWS and non-federal parties wishing to carry out conservation actions on behalf of candidate species, such as the LPC and the SDL. This program provides non-federal property owners with assurances that voluntary conservation efforts undertaken on behalf of a candidate species will not result in future regulatory obligations, should listing occur, beyond those agreed to in the CCAA. Thus, from a private landowner perspective, conservation practices can be safely carried out without fear of additional regulatory burdens or land use restrictions at some later date. The impacts of listing are known in advance. These rights and assurances are transferable upon sale of the land, if the new owner agrees to become part of the CCAA.

Participants in a CCAA voluntarily commit to implementing specific management actions that the FWS determines will significantly contribute to eliminating the need to list the target species. These may include actions taken by property owners to protect existing populations or habitat areas, reduce habitat fragmentation, restore degraded habitat, create new habitat, augment existing populations, or restore historic populations. A CCAA may also include allowing access for species surveys. Thus, many of the actions and strategies described in this chapter might be included for coverage under a CCAA. The FWS provides technical assistance in the development of these agreements, and evaluates the effectiveness of proposed actions with regard to species conservation needs.

No single property owner's action may eliminate the need to list, but CCAAs may encompass and take into account the actions of many parties over a wide area. An existing CCAA for another prairie grouse species, the Columbia Sharp-tailed Grouse, offers a useful example of this kind of effort. Negotiated between the FWS and the Oregon Department of Fish and Wildlife, it coves a large geographic area and involves numerous private landowners.

CCAAs apply only to non-federal lands, and so cannot alone provide satisfactory assurances to parties whose land uses include both private and federally leased lands. However, parallel protections from listing-related encumbrances on the use of federally leased lands may be negotiated between the FWS and the BLM. Should listing occur at some time in the future, landowners not already participating in a CCAA may still engage in a Safe Harbor Agreement with the FWS. Like a CCAA, but applying only to listed species, a Safe Harbor Agreement provides assurances against additional restrictions should a listed species colonize a landowner's property or increase in numbers as a result of habitat enhancement or other conservation management.

The Working Group strongly recommends that a CCAA be negotiated with both the NMSLO and the NMDGF in all or portions of Eddy, Lea, Chaves, De Baca, Curry, Roosevelt, and Quay counties. Private landowners in the area, many of whom carry out grazing and/or mineral development on both private and leased land, could be included in this agreement by a Certification of Inclusion. Individual CCAAs between a landowner and the FWS are also possible. Because of the checkerboard nature of land ownership in the region, participation would increase if the CCAA were developed in tandem with a similar conservation agreement with the BLM.

Conservation Benefits

As an instrument for encouraging voluntary conservation efforts, a broad-scale CCAA would help achieve the benefits associated with many of the conservation strategies outlined in this document. Benefits achieved by state agencies—such as those accruing from NMDGF management of state Prairie-Chicken Areas—and by private conservation efforts would be formally recognized. With landowner participation, increased survey access on private lands would help in overall planning and management efforts for the LPC and SDL.

Evaluation

At the time of the agreement, the FWS makes a written finding that the target species will receive a sufficient conservation benefit from the activities covered in the CCAA. Once the agreement is in effect, management standards cannot be raised, even if expected benefits do not materialize.

Project Area

Potentially the entire area encompassed by the three planning regions, or some portion of that area.

Priority Assessment and Special Considerations

Highest priority. As noted above in "Prerequisites for Implementation," conservation strategies may not be implemented on private lands if protections against further regulatory burdens are not provided. This may be particularly important for ranchers and other property owners whose economic status might be compromised by new and unforeseen restrictions on land use. An important consideration to ranchers is that comparable protections exist for federally leased grazing lands as for private lands. Since a CCAA cannot apply to BLM lands, the FWS and BLM must negotiate and provide separate and sufficient management assurances, similar to CCAA provisions, that would also apply to federal lease lands.

Parties responsible

The FWS should take the lead in developing and promoting a CCAA for southeast and east-central New Mexico, with principal cooperators including the NMSLO, NMDGF, and BLM.

Parties affected

Voluntary participation would be open to state agencies and all private parties in the area covered by the agreement.

Funding

Administrative costs would be assumed by the various agencies. A CCAA does not provide financial incentives to property owners—these must be sought through other mechanisms.

Pathway 4: Work towards reestablishing LPCs in southeast New Mexico

- Conservation Strategy 4.1: Identify, manage, and restore potential habitat areas in southeast New Mexico.
- Conservation Strategy 4.2: Establish a captive propagation and LPC reintroduction program in southeast New Mexico

Pathway overview: Opportunities and challenges

The Isolated Population Area (IPA) south of Highway 380 in Lea and Eddy counties is the southernmost portion of the LPC's geographic range, and some reports suggest that LPC populations were never as abundant or stable in this region as in the core of the range further to the north. However, this region has long been considered part of the historical range of the LPC in New Mexico. LPC habitat in the IPA has been negatively impacted by a number of factors, including recent years of drought. This habitat is also highly fragmented, in part due to the long history of oil and gas development in the region. Despite this history, LPC populations expanded in the relatively wet 1980s, and numerous leks were present. Rapid declines began in 1989. In recent years, only one lek, near Eunice, has remained active, though scattered sightings of LPCs have been reported in other locations.

In its most recent review of the candidate species status of the LPC, the FWS specifically noted its concern that further disturbance and fragmentation on remaining undeveloped BLM lands in southeast New Mexico may preclude eventual population recovery in this region. The Working Group shares this concern, and has outlined a number of strategies aimed at reversing habitat loss and population declines. LPC recovery in the IPA has two basic requirements. Somewhere in the region, habitat areas must be preserved and/or restored that have the capability of supporting one or more viable LPC populations. Strategy 4.1 addresses this need, making reference to applicable strategies described in other Pathways. It reviews efforts already under way to identify important remaining LPC habitat in the IPA, and management options pertaining to oil and gas development from Pathway 2.

The second requirement is that birds eventually reoccupy whatever suitable habitat has been provided. With this goal in mind, and also as insurance against the possibility of catastrophic population declines elsewhere, the Working Group has proposed that a LPC reintroduction program be carried out, coupled with a captive propagation facility in the Carlsbad area. Considerable progress has already been made in planning this effort, which is described here in strategy 4.2. The Working Group believes that coordinated pursuit of these two strategies will greatly accelerate the return of the LPC to the southern portion of its range in New Mexico, and thereby address one of the major concerns expressed by the FWS in its finding the species warranted for federal listing.

Conservation Strategy 4.1: Identify, manage and restore potential habitat areas in southeast New Mexico

As noted above, the LPC is currently absent, or almost so, from the Isolated Population Area (IPA) in Lea and Eddy counties (see Maps 2 and 3). The extent of contiguous LPC habitat in this region has been reduced by drought, development, and changing land uses. However, scattered habitat areas of varying size remain, and may provide suitable habitat for nesting, brood-rearing, foraging, and dispersal. In some of these areas sporadic sightings of LPCs have been recently reported, but most are of a size that will not currently support viable populations.

Future reintroduction or natural expansion of the LPC back into the IPA necessitates that some of these remaining habitat areas be brought into some form of protective management. This is particularly important for areas that have been determined to have high conservation value, and that occur within a surrounding landscape matrix where restoration and re-occupancy may occur. The Working Group recognizes, however, that not all remaining patches of undeveloped rangeland warrant such management protection. There may be little biological benefit in preserving rangeland fragments that are highly impacted or surrounded by active development.

Landscape Analysis

The group has recognized a pressing need for a thorough biological inventory and habitat assessment of the IPA, coupled with an analysis of current and anticipated future trends and locations of oil and gas development. Such efforts have been ongoing since before the formation of the Working Group, and have continued with the goal of identifying possible sites for LPC reserves, other habitat areas of conservation value, and areas where development should not be limited by conservation considerations.

Habitat mapping across a broad area is being carried out through the use of aerial photographs and a variety of biological survey methods at specific sites. Thorough LPC surveys on state, BLM, and private lands are particularly important to complete this process. Access to some private lands has been denied in the past. Gaining access will require a coordinated effort to negotiate with and build the trust of landowners. This should include discussions of protections available from the FWS in the event of future listing (see Conservation Strategy 3.4). The proposed Eastern Plains Conservation Coordinator (see Pathway 8) should play a lead role in facilitating such efforts.

Tied to the survey and habitat review process must be consideration of the potential value of particular areas to the oil and gas industry. As a general principal, economically important areas should not be placed off limits to development or under restrictive lease stipulations without strong biological justification. Prioritization of areas for LPC conservation or energy development should occur through a collaborative assessment process involving both agency and industry representatives.

Fairly early in its negotiations, in the summer of 2003, stakeholders identified a number of general areas in the IPA that were thought to have the greatest potential for LPC habitat, and where further biological and economic assessment was warranted. Subsequently, analysis based on aerial photographs and ground-based site assessment by the BLM Carlsbad Field Office identified and mapped a set of 17 areas with habitat characteristics favorable for LPCs. Many of these coincided with the general areas already identified by the Working Group. In some cases, however, industry representatives felt that the CFO analysis rested too exclusively on vegetative composition and structure, and did not factor in the degree of existing development and economic values.

In Conservation Strategy 2.1, as part of the recommended leasing guidelines for the IPA, the Working Group recommends that further habitat suitability analysis be conducted in the IPA, focusing on the 17 areas previously identified by the Carlsbad Field Office as having habitat that may be of value to LPC recovery, and on areas where LPCs have recently been sighted. This analysis should be completed by January 1, 2007, or sooner. Agencies and industry should work together to expedite the habitat analysis, and to ensure that sufficient manpower and resources are available to meet the target deadline.

Focus areas should be prioritized for reclamation potential, and for potential to maintain re-established LPC populations over time. An advisory committee of stakeholder representatives should be formed to work with and offer input to BLM regarding prioritization of areas, and subsequent management recommendations. Areas determined to be lacking high conservation value should be eliminated from further consideration for special management.

Conservation and Management Recommendations for the IPA

LPC Reserves

In Conservation Strategies 2.1 and 3.2, specific recommendations are made regarding the establishment of new LPC reserves in the IPA. LPC reserves should consist of at least 4 square miles (2560 acres) of contiguous habitat that is predominately shrub/grassland on sandy soils. It is desirable that the surrounding 12 square miles (7680 acres) be managed with major considerations for LPC habitat, through the various strategies described in Pathways 1 and 2. LPC reserves may be located on public or private lands. It is understood that, initially, not all of the acreage in and around a LPC reserve area may be suitable LPC habitat, but that the standards for LPC reserves may be achieved in these areas over time through appropriate management.

It is recommended that two new areas or combinations of areas that can function as LPC reserves and sites for LPC reintroduction, be established in the IPA/Carlsbad area. These should be located within predominantly suitable habitat areas large enough to support viable LPC populations and meet other criteria specified in Conservation Strategy 3.2. It is recommended

that the WIPP site serve as the location of one such reserve (see Conservation Strategy 4.2). Potash enclaves and private lands that may be available from willing sellers should be considered as a second possible reserve location.

Other Habitat Areas

Smaller or more isolated blocks of habitat, not meeting the criteria for LPC reserve areas as described above, may still be important to future LPC recovery in the IPA. These may be considered building blocks around which restoration activities may be focused and, over time, larger areas of suitable habitat may be established. Areas falling into this category are to be identified through the process of site analysis and prioritization described above under "Landscape analysis".

In Conservation Strategy 2.1, the group recommends that BLM should pursue a range of options to maintain habitat value in areas determined to be of high conservation importance. These options include guided development on existing leases through the use of PODs and voluntary agreements (as described in Conservation Strategy 2.2,) lease stipulations, deferral of new leasing in areas determined to have value for LPC recovery, and other strategies. Management approaches will be determined and pursued as appropriate, on a case-by-case basis. Note that some areas that may be important to LPC recovery may already be receiving management protection under guidelines adopted for the Sand Dune Lizard.

Reclamation

The group recommends that coordinated efforts to reclaim and restore habitat in previously developed areas be carried out when and where opportunities arise, as described in Conservation Strategies 2.2 and 2.3. Priority locations are areas in and around LPC reserves and other important habitat areas, and locations where restoration can help re-establish connectivity between isolated habitat blocks. In these areas, specific restoration and management practices should be determined and implemented on a case-by-case basis.

Management Guidelines for Mineral Leasing and Development

The following list summarizes the recommended leasing and development guidelines for the IPA, previously stated in Conservation Strategies 2.1 and 2.2.

1. In occupied habitat in the IPA/Carlsbad area the group recommends deferring new leasing with surface occupancy of state and federal minerals. Federal leasing with a No Surface Occupancy (NSO) stipulation may be allowed.

2. Once the recommended LPC reserves are established, further surface occupancy leasing of fluid minerals would be deferred in these areas.

3. Additional habitat areas considered important to future LPC recovery in the region, as may be identified and agreed to by processes described above, may be subject to a range of management options as discussed in Conservation Strategy 2.1 If recovery potential exists in these areas, the parties will institute adaptive management practices.

4. Deferments would remain in place pending realization of criteria to be determined. Future leasing in occupied or other protected habitat would be linked to the status of the species and/or habitat in New Mexico, as identified in the annual FWS candidate notice of review and other periodic agency review.

5. In areas that have already been leased, development may proceed at the discretion of the lease holder. In sensitive habitat areas and where existing LPC leks may be affected, the group recommends that lease holders consider various "least impact" options, including choosing to forego development until a later date and/or use of directional drilling to avoid surface disturbance. When and where these options are not considered feasible, voluntary compliance is encouraged to limit new surface disturbance and minimize development impacts in LPC habitat, using strategies discussed in Conservation Strategy 2.2.

6. For existing federal mineral leases BLM may employ negotiated Conditions of Approval (COAs) and Plans of Development (PODs) to help ensure orderly development with a minimum of surface impact. These requirements should not be used to prevent development from moving forward at a reasonable pace. Included in COAs and PODs may be specification of various strategies for minimizing impacts associated with new development, and for plugging wells and reclaiming developed areas upon depletion.

7. Existing timing and noise stipulations, such as are currently in place on federal mineral leases in LPC areas, should be maintained only as needed. These stipulations are intended to prevent disruption of LPC leking and nesting by activities associated with energy exploration and development. Stipulations should apply only in areas where LPCs are present, as indicated by sightings or survey reports within a period of 2 years. Exceptions should be considered on a case by case basis. In areas where adequate surveys over two years have not detected LPCs, stipulations should be waived. They should be re-applied if LPCs reappear.

Conservation strategy 4.2: Establish a captive propagation and LPC reintroduction program in southeast New Mexico

Description

The Working Group recognizes that identifying and protecting remaining LPC populations and important habitat areas are priorities for immediate action in southeast New Mexico. However, the group also believes that a program of captive propagation and/or managed reintroduction may be of great value in speeding the return of LPCs to abandoned areas. Help and guidance in developing this strategy is being sought from members of the LPC Interstate Working Group, and from experts associated with the captive propagation of the Atwater's Prairie-Chicken in Texas.

Captive propagation can provide a source population for reintroducing birds to unoccupied portions of the historic range. It can also provide some insurance against unexpected, catastrophic declines in existing wild populations. The group believes that a sound and cautionary approach is to begin development of a captive propagation program now, alongside other efforts to protect and improve habitat, and while core LPC populations appear to be stable.

Having a capacity to carry out captive propagation and release may in the long term enhance the benefits of habitat protection and improvement strategies, and help speed population recovery.

The introduction of birds transplanted from other areas is a second option for re-establishing LPC populations in the IPA or elsewhere. Although LPC transplant efforts have failed in the past, no such attempts have been made using the full array of technical and biological knowledge now available. The Working Group believes the transplant option has great promise and should be explored, but that careful consideration must be given to the possibility of negative impacts of such a program on source populations.

Captive propagation and reintroduction will require a period of research and development before achieving positive results. Members of the Working Group have explored various options for captive breeding facilities and new LPC reserve areas for reintroduction, focusing on the Waste Isolation Pilot Plant (WIPP) site near Carlsbad. This location can only be considered pending Department of Energy (DOE) approval. The breeding facility and the reserve area may be considered separate but related project elements, which may be developed independently or in tandem. The WIPP site offers good LPC habitat over a fairly large area (approximately 10,000 acres) in a managed setting in which other activities are limited or restricted. Surface area would be made available by the DOE, which owns and manages WIPP facilities. A reserve at the WIPP site would help meet the important goal of securing new protected areas for LPC management in southeastern New Mexico (see Conservation Strategies 3.2 and 4.1).

Reintroduction at WIPP or elsewhere could be accomplished by the managed release of LPCs reared in captivity or transplanted from other areas. An initial goal for the captive propagation project would be to populate WIPP lands with LPCs produced at a facility located on-site. If such a facility can be developed, reintroduction on WIPP lands would be just the first step of a long-term strategy for reintroducing LPCs to various locations throughout their historic range.

A more detailed scientific and feasibility analysis of captive propagation and transplant reintroduction is needed. Critical to the success of this strategy will be the development of a technical capacity to breed, raise, transport and successfully release LPCs. Ensuring genetic diversity in any re-established population must be a prime consideration. This effort will require extensive coordination among state and federal agencies, and the involvement of outside experts with experience in captive propagation of prairie grouse. Construction and management of the facility should be undertaken by a private company with a record of success in other projects involving gallinaceous species. Considerable funding will be required, as will the availability of sufficient acreage for both the propagation facility and a reserve area large enough to support a viable population.

Conservation Benefits

Captive propagation and/or transplanting can increase the effectiveness of other conservation and recovery efforts, while providing insurance against catastrophic declines. Establishing reserves and reintroducing LPC populations in southeastern New Mexico will expand the occupied range of the species, and are considered necessary components of LPC recovery.

Project Area(s)

Initial planning for this strategy has focused on the WIPP site because of the availability and known desirable attributes of this location.

Priority Assessment and Special Considerations

The group has agreed to elevate captive breeding to priority status, with the understanding that this must not be seen as an alternative to habitat protection. Members are in general agreement about the potential value of WIPP lands as a location for one of several LPC reserves in southeastern New Mexico. Other possible locations should continue to be explored. Funding for this strategy should not decrease or detract from funding for more pressing and immediate needs, particularly efforts to maintain isolated or threatened populations and habitat areas. Any attempt to establish a new LPC population at the WIPP site, whether by transplant or captive propagation, should be accompanied by strong efforts to provide habitat connectivity with existing populations to the north and with other reintroduction sites (see Conservation Strategy 4.1).

Parties responsible

Potentially and pending approval, DOE for matters relating to the WIPP site. NMDGF for matters relating to LPC reserve areas and reintroduction efforts. This strategy will also require extensive coordination with BLM and the involvement of outside experts and private contractors.

Parties affected

On WIPP lands, this project may significantly impact adjacent property owners and grazing lessees. Appropriate safeguards and compensation must be provided.

Funding

At WIPP, if approved, DOE would provide surface area and is a possible source of additional funding. Support for facility construction may be forthcoming from the oil and gas industry. Additional funding may be provided by private sources, philanthropic organizations, and sportsmen's groups.

Pathway 5: Reduce other causes of disturbance and mortality

- Conservation strategy 5.1: Seek to reduce mortality by predation, when and where it will be most effective in contributing to long-term population viability
- Conservation strategy .5.2: Reduce vehicular mortality and disturbance through road closures and ORV management
- Conservation Strategy 5.3: Reduce mortality from unlawful hunting and accidental shooting
- Conservation strategy 5.4: Reduce winter mortality by planting grain crops in selected areas.

Pathway overview: Opportunities and challenges

To a large degree, the impact of various sources of disturbance and mortality on LPCs are mediated by habitat quality. In fragmented landscapes or areas with poor vegetative cover, LPCs are more vulnerable to predation and various forms of human disturbance. Many of these factors may be best addressed through efforts to protect and improve habitat; however, an additional set of strategies exists for boosting recruitment by directly targeting specific sources or agents of LPC mortality, or of reduced nesting success. While none of these strategies alone may have a major impact on the status of LPC populations, cumulatively, and in concert with other efforts, they may be significant in helping tip the balance of annual births and deaths in a positive direction.

Positive and negative aspects of predator control have been debated by the Working Group. The effectiveness of this strategy may be limited by the diverse array of birds, mammals, and reptiles that prey upon LPC eggs, chicks, and adults. Raptors, which account for the majority of predation in some studies, are protected by law. Control efforts targeting coyotes may have a positive or negative effect, depending on how a reduction in the coyote population might affect densities of other mammalian nest predators. Nevertheless, the group agrees that predator control may be a useful short-term strategy in some circumstances. It may sometimes help protect small or scattered populations, in areas of limited cover, pending improvements to habitat. In such circumstances predator control may be applied on an experimental basis, with close monitoring of the population responses of target and other species.

Poaching or inadvertent shooting by hunters accounts for some LPC mortality, and may be reduced through a campaign of education and enforcement. Disturbance of lekking or nesting activities by cars and ORVs may be significant in some areas, though data on such impacts are lacking. Closing some roads to public use and enforcing ORV restrictions in key habitat areas may be an important strategy for protecting some LPC populations. Finally, although food scarcity is not thought to be a significant source of mortality for LPCs, the planting of grain crops as winter forage may help boost survival rates in some populations, particularly during times of drought or resource scarcity.

Conservation Strategy 5.1: Seek to reduce mortality by predation, when and where it will be most effective in contributing to long-term population viability

Description

Sooner or later most LPCs succumb to predators, making predator control an intuitively appealing approach to increasing annual survivorship (Schroeder and Baydack 2001). However, a number of factors should be considered before such a strategy is adopted. A wide variety of mammals, birds, and reptiles are known to sometimes prey on LPC adults and chicks, or raid nests for eggs. Some are protected by law and so cannot be targeted for traditional control efforts. Reductions in mortality rate from one predator may be compensated for by increases in predation by other species.

Mortality on LPCs can be caused by a wide variety of predators including snakes, skunks, ravens, foxes, coyotes, and raptors. Studies suggest that predation on adults and juveniles is

highly concentrated in the nesting and brood-rearing season. In Roosevelt County, half of annual female mortality occurred in the month of May, demonstrating the vulnerability of nesting hens. Over 40 percent of male mortality also occurred in the March-May leking and nesting season (Wolfe and Patten 2003). In Kansas, of 109 adult LPC mortalities for which a cause was determined, 66% were due to predation by mammals and 19% due to predation by raptors (R. J. Robel, pers. com.). In Oklahoma, 25% of 100 mortalities were attributed to predation by mammals and 33% to predation by raptors (Wolfe et. al 2003). In the New Mexico study cited above, it was thought that mammalian predators accounted for more losses than avian predators, but exact numbers could not be determined. These numbers suggest that risk from different kinds of predators may vary greatly at different locations, and site-specific studies are needed.

Avian Predators. A number of avian predator species are present in southeast New Mexico during the LPC breeding season including Chihuahuan Raven, Cooper's Hawk, Red-tailed Hawk, Ferruginous Hawk, Prairie Falcon, Northern Harrier, and Great-horned Owl. The extent of predation accounted for by any or all of these species is unknown. High rates of predation by raptors have been demonstrated in other locations and for other prairie grouse species, but not for LPCs in New Mexico.

All of these avian species are protected by law, making traditional predator control efforts impossible. However, efforts to discourage raptor nesting and perching in the vicinity of leks and LPC nesting areas remain an option. This could be accomplished most effectively by the elimination of trees, power poles and other vertical structure from these areas. The introduction of such features into prairie landscapes has been thought to increase predation rates, and also cause habitat avoidance (Bidwell et al. 2001, Robel et al. 2004). However, such a strategy may not be considered technically or economically feasible in some areas. An alternative is fitting power poles with deterrent devices to prevent raptor nesting. This may be worth attempting, on an experimental basis, in any area where predation by nesting raptors is known to be a problem. Such a strategy would not necessarily affect the use of structures by hawks as hunting perches, however, and would certainly not affect aerial foragers such as Northern Harrier.

Mammals and snakes. Terrestrial predators that may be sources of LPC mortality in New Mexico include raccoon, striped skunk, ground squirrel, coyote, badger, fox, and bullsnake. Effects of trying to control any or all of these species are unknown. Some potential nest predators may themselves be limited by predation by a more dominant predator species. Control of the dominant predator can allow these other predators to increase, resulting in an unintended increase in total LPC mortality. A similar unintended ecological consequence of predator control may occur if there are large population increases of rodents and rabbits that may have a negative effect on the vegetation of LPC habitat. It is generally agreed that the best predator defense LPC's have is quality vegetative cover in which nests and broods can be successfully concealed.

Despite these drawbacks and concerns, however, predator control may be beneficial in some circumstances. Use of predator control should be carefully considered as a strategy for protecting isolated leks and populations, where maximizing annual recruitment is vital to maintaining population viability. Control efforts can only be considered successful if reduction in one or more predators, such as coyotes and foxes, reduces total mortality on LPC eggs,

hatchlings, and nesting hens. This strategy may initially be pursued on an experimental basis, with careful monitoring to assess ecological outcomes.

Conservation Benefits

Potentially, predator control could contribute to preserving small, isolated populations subject to significant predator-caused mortality.

Project Area(s)

Predator control should only be considered in the SSPA and the IPA. Control efforts should focus on the areas where most nesting occurs—within 1.5 miles of active lek sites.

Priority Assessment and Special Considerations

This strategy has limited applicability, but may be beneficial in protecting small and isolated populations. The smaller a population is, the more it is affected by the loss of any individuals. Disturbance to nesting and brooding LPCs from control methods should be minimized. In any application of this strategy, effects of control efforts on predator and small mammal communities, and on LPCs, should be closely monitored.

Parties Responsible

NMDGF, BLM, USDA Wildlife Services.

Parties Affected

Landowners and ranch operators.

Funding

NMDGF, BLM, oil and gas developers, ranchers.

Conservation Strategy 5.2: Reduce vehicular mortality and disturbance through road closures and ORV management

Description

Nesting success and recruitment of young into the LPC population has been identified as a key element in enhancing the conservation of the species in southeastern New Mexico. A number of conservation strategies are directed at enhancing nesting success and protecting nesting and brood rearing habitat. These include maintenance of cover and food production, avoiding surface disturbance within 1.5 miles of leks, and minimizing disturbing activities during key periods in the bird's life cycle. This conservation strategy focuses on minimizing noise disturbance and intrusion to LPCs during sensitive periods of the year, by managing off-road vehicle (ORV) use and road access in key areas.

Management of ORV use and road access issues will include:

- Restriction of recreation ORV use on public land in the planning area to public roads, or areas designated for ORV use.
- Identification of existing ORV designations and access issues in key LPC areas where those activities could adversely affect populations or habitat

- Evaluating the adequacy of existing designations and access management for each key area.
- Asking appropriate management authorities to adjust designations or access if designations are lacking or are inadequate, or access to key areas is creating adverse effects. In the case of BLM-administered lands, adjustments to ORV designations or road closures will generally require an amendment to the Resource Management Plan (RMP). Emergency closures can be implemented for serious issues; however, the BLM would need to ensure there is RMP conformance to continue an emergency closure beyond a two-year period.
- Surface management agencies will be asked to perform adequate enforcement of ORV designations or road closures and monitor ORV use in key areas to determine if impacts are occurring.
- Conformance with ORV designations or road closures may require additional signing, public awareness, enforcement, and rehabilitation of roads that are permanently closed.

Conservation Benefits

Limiting disturbance to nesting activity and very young birds will enhance nesting success and recruitment of birds into the population. Additionally, limiting ORV use to existing roads and trails and implementing selective road closures will reduce impacts to vegetation in key habitat areas.

Project Area(s)

This conservation strategy potentially applies to all active LPC population areas on public lands, or where private landowners choose to participate. ORV designations and road closures will be considered for key LPC areas and seasons to minimize adverse impacts to LPC populations and habitats. Key areas include core areas, reserves, and selected scattered population areas usually within 1.5 miles of LPC lek sites. Part of this proposal is to identify key areas where ORV management and potential road closures would enhance the conservation of the species.

Priority Assessment and Special Considerations

This strategy could yield significant benefits if areas identified where LPC breeding, nesting, or brood-rearing activities are subject to ORV disturbance. How ORV or road closures are managed will vary with the authorities of the surface management entity or landowner. Special designations or road closures must conform to the authorities and processes of the surface manager or landowner.

Parties responsible

Regulating ORV use and implementing road closures could occur on any land status (federal, state, or private) at the discretion of the appropriate surface management authority.

Parties affected

ORV enthusiasts are the primary user group that would be affected. However, road closures could affect any land user in the area. Impacts from road closures are likely to be limited due to the fact that the roads most likely to be closed would be duplicative access roads and limited to those ways that are creating resource damage within 1.5 miles of lek sites. Other affected

interests would be surface management entities or landowners including BLM, NMSLO, private landowners, and possibly county governments.

Funding

Funding for ORV management and road closures would be primarily borne by the surface management agency. If designations and closures are done as part of a larger conservation effort, additional grant or cost share funds may be available to assist with planning and implementation costs.

Conservation Strategy 5.3: Reduce mortality from unlawful hunting and accidental shooting

Description

Dove and quail hunting are popular in some areas inhabited by LPCs. Although they differ in size and description, LPCs might be accidentally shot by dove or quail hunters who did not take the time for proper identification. In addition, some might illegally harvest LPCs because they are rare and therefore valuable. Both cases represent additional mortality that might not be replaceable, particularly in small populations with low recruitment.

Three steps could successfully reduce this source of mortality. First, posters informing hunters of the differences between LPC and other upland gamebirds, and of penalties for shooting LPCs, should be distributed at sporting good outlets throughout the LPC range prior to fall hunting seasons. Second, areas where dove and quail hunting is popular and LPCs reside need to be identified. Third, these areas should be patrolled by NMDGF officers with increased intensity when most bird hunting occurs. Increased patrols would best be focused at the start of dove and quail seasons and on long weekends when more hunters are likely to be in the field.

Conservation Benefits

As populations decline and become more scattered, all losses of individuals become important. Reducing this source of mortality could result in more hens that successfully nest. The benefits could be exponential. A hen that is saved from accidental shooting might produce 10 chicks the following spring, half of which might be recruited into the population. One of those new recruits might travel to a neighboring population and contribute to genetic interchange.

Project Area(s)

Emphasis to reduce this source of mortality should be on public lands with high concentrations of hunters that are also inhabited by small and isolated populations of LPCs. Efforts should secondarily be focused where LPC populations are larger and are openly accessible to the public.

Priority Assessment and Special Considerations

While not of highest importance, this strategy should reduce annual LPC mortality in some areas. Priority areas should be chosen through consultation among those knowledgeable

regarding distribution and abundance of hunters (local NMDGF conservation officers, hunters) and LPCs (agency biologists).

Parties Responsible

NMDGF field operations, NMDGF public affairs, hunters, license vendors.

Parties Affected

Hunters

Funding

NMDGF for increased patrols and distribution of informational posters.

Conservation Strategy 5.4: Reduce winter mortality by planting grain crops in selected areas

Description

Generally, forage is not a limiting factor for LPC populations. Like most upland bird species, LPC populations are limited by recruitment (chicks surviving to reproduce) and survival is not usually determined by available food. Nevertheless, there are limited circumstances in which cultivated crops may boost over-winter survival of LPCs and help sustain populations over time. Isolated populations that are small and located in poor habitat are less likely to produce sufficient numbers of young that persist over time than are large populations in high quality habitat. Harsh weather, such as prolonged or severe winter, may increase mortality such that these vulnerable populations disappear. The presence of winter grain or foliage can provide needed energy to improve the chances of survival for such populations. Crops such as grain sorghum and alfalfa are used preferentially by LPCs and should be left as waste grain, at the corners of pivot irrigated fields and along otherwise unused edges. This strategy explicitly does not promote the conversion of healthy rangelands into cultivated crops (a significant threat to LPC habitat), but rather supports maintaining crops where they may provide the most benefit.

Conservation Benefits

Conservation benefits may be limited, but could be particularly important for sparse and scattered populations during times of extreme stress such as severe cold, ice, or snow. Any strategy that boosts over-winter annual survival will be of benefit, especially in areas where LPC numbers are low.

Project Area(s)

Primarily the Sparse and Scattered Population Areas.

Priority Assessment and Special Considerations

This is not considered a high priority strategy by the Working Group; in fact, it should be employed with some caution. Food plots may provide temporary protein to LPCs, but should not be used as a long-term solution to poor quality habitat. Cultivated crops alone cannot meet the nutritional needs of LPCs as no one crop contains the full complement of essential amino acids. Also, predation in agricultural areas may be high, especially if plots are small and used regularly.

Plots should be larger than ten acres in size to be of benefit, and in all cases should be located away from power lines and poles where predatory birds may roost. Finally, food crops located far from LPC habitat areas, will attract birds, at great energetic expense, to areas that do not provide for other needs, such as roosting and protection from predators. Food plots should only be encouraged where they are within one mile of lek and roosting areas.

Parties Responsible

NMDGF, NRCS, NMSLO

Parties Affected

Farmers

Funding

NRCS, FWS (PFF), NMDGF (LIP, SWG)

Pathway 6: Research, monitoring, and evaluation

A number of the conservation strategies already discussed involve or depend upon the gathering of baseline biological information about the status and distribution of LPC populations and habitat areas. In addition, all of the strategies proposed include evaluation and monitoring as a necessary tool for gauging success and improving effectiveness. Baseline data and ongoing assessment of project outcomes are the two key ingredients of adaptive conservation management.

Biological surveys and habitat monitoring

The importance of biological surveys and habitat assessment has been described in several previous sections. In addition to any specific recommendations elsewhere, LPC survey and habitat monitoring efforts should include:

- More roadside survey routes to locate additional sparse and scattered leks in north Roosevelt, Curry, and east De Baca counties.
- More intensive surveys in the Crossroads area.
- Monitoring of a random sample of all leks: 1) in south Lea and Eddy counties; 2) in southeast Chaves county south of highway 380; 3) on BLM lands in east-central Chaves County; and 4) on or near all NMDGF Prairie-Chicken Areas.
- Annual counts of numbers of leks along samples of roadside routes in: 1) north Roosevelt and Curry counties, and nearby portions of De Baca and Quay counties; and 2) in south Roosevelt and north Lea counties.
- Field monitoring of habitat conditions, every 3 years as appropriate, on a random sample of areas within 1.5 miles of: 1) all active or recently active (within 5 years) lek sites in south Lea and Eddy counties; 2) all active lek sites in southeast Chaves County south of highway 380; 3) a random sample of lek sites in north Roosevelt and Curry counties; and 4) a random sample of lek sites in south Roosevelt, north Lea and east-central Chaves counties.

Research needs

Beyond ongoing surveys and habitat monitoring, biologists have identified a number of specific research needs that, when met, can aid decision-making and increase management effectiveness. Some studies are currently ongoing; others will be developed both in conjunction with and independently of direct conservation efforts. Only study results that meet sound scientific standards should affect management policy. It should be understood, however, that management can and must proceed using the best available science, recognizing that ecological responses are never completely predictable, and definitive resolution of some issues may not be forthcoming. The mission and value of applied research is not to furnish proofs but to clarify and interpret empirical relationships with a greater degree of precision and certainty.

The following topics and issues have been identified as research needs pertaining to LPC conservation and management.

- Effects of different grazing systems or management prescriptions on LPC habitat and population parameters.
- Impacts of noise associated with oil and gas operations on LPC lek display and nesting activities.
- Impacts of roads, fences, power lines, and structures on LPCs. This includes evaluation of mortality from collisions and fragmentation effects produced by LPC avoidance.
- Community and species-specific responses to predator control.
- Routes and mechanisms of LPC dispersal.
- Natal area imprinting and nest-site fidelity in LPC hens.
- Levels of genetic diversity in core and isolated LPC populations.

Evaluation of conservation efforts

Specific recommendations for evaluating the effectiveness of different strategies have been made in some of the strategy sections. At the operational level, success in implementation can be evaluated based on the degree to which specific recommended actions have been taken, and recommended programs established. Beyond this, however, there is a desire to measure success relative to the general goals and objectives of the Working Group and of this document. At this level, "success" relates to the degree to which the status of the LPC and SDL have improved, and the degree to which existing land uses have been maintained.

The Working Group recognizes that recovery of at-risk species may be a long-term process, extending beyond the lifespan of this strategy document. Nevertheless, it is important to try to specify what long-term conservation success would look like. Under what circumstances populations of the LPC and SDL in New Mexico might be viewed as safe and self-sustaining, such that some or all of the measures proposed in various Pathways might be scaled back? Because the group's strategic goals and objectives specifically address the issue of federal listing, a finding by the FWS that the two species are no longer warranted for listing would be one strong indicator of conservation success. Specific measures of success may also relate to the status of populations and habitat in the different geographic regions—for example, an increase in the density of leks in the SSPA such that the description "sparse and scattered" no longer applies.

The Working Group is developing other, more specific criteria for measuring outcomes and evaluating the overall success of collaborative conservation efforts, and has tasked a committee to work on this. As of February 2005 this work is not yet complete. However, the group has identified a more general set of issues and criteria that should be given consideration in any measures of outcome. These include:

- The present population levels, trends, and distribution.
- The amount of quality habitat and the degree to which it is expanding/contracting.
- Climatic conditions.
- The latest and best scientific information regarding species biology.
- The degree of reclamation (successes and failures).
- The degree to which there is a viable population.
- The success of reintroduction.
- The species not being recommended for listing as threatened or endangered.
- The level of implementation compliance.
- Other important natural, social, and economic factors.
- Other unanticipated positive or negative events.

Pathway 7: Education and outreach

Effective communication among and between groups is an essential and ongoing component of broad-scale conservation efforts on behalf of the LPC and SDL. Public education and outreach is one part of this, but the Working Group recognizes a broader array of communication needs, extending between different constituency groups. The Working Group itself has undergone a lengthy educational process by which stakeholders have gradually reached more complete understandings of each other's interests. As the strategy recommendations contained in this document become implemented, it is vital that education and information-sharing be expanded in scale to involve the larger communities of ranchers, oil and gas operators, property owners, conservation advocates, agency personnel, and others who may be affected by or contributors to conservation efforts.

Public education and outreach

The annual High Plains Prairie-Chicken Festival in Milnesand is one established and effective vehicle for spreading awareness of LPC conservation needs, reaching both residents of east-central New Mexico and visitors from other areas. The festival provides outstanding opportunities for people to view leking LPCs while learning about species biology, habitat needs, and conservation status from local experts. It may provide an excellent forum for a public presentation describing the cooperative conservation efforts of the New Mexico LPC/SDL Working Group and this LPC Conservation Strategy.

Educational activities and materials such as those that have been developed for the High Plains Prairie-Chicken Festival should be made available to a broad audience in southeast and east-central New Mexico, and beyond. General information about the LPC and SDL, their conservation needs, and the strategies being undertaken to meet those needs, may be distributed

in a variety of ways. Agency public affairs departments should be called on to help prepare and distribute brochures and other materials. Press packages should be distributed to local media in conjunction with the High Plains Prairie-Chicken Festival, and upon the completion and release of this Conservation Strategy by the Working Group. The NMDGF publication *New Mexico Wildlife*, distributed as a newspaper insert, provides another excellent means of delivering news about LPC and SDL conservation to a wide audience.

Education and outreach to stakeholder groups, agencies and local governments

Beyond the level of general public education, targeted outreach to specific groups is needed. Ranchers should be made aware of specific LPC habitat requirements (including the recommended standards for vegetation contained in this document), and of the role each ranch operator may play in creating or maintaining quality habitat for nesting and brood-rearing. As mechanisms are developed for providing financial compensation for more conservative grazing, and legal protections under Candidate Conservation Agreements with Assurances, it is imperative that the ranching community as a whole be fully informed regarding these options. As strategy implementation occurs, communication with ranchers must be a two-way conversation between management agencies and ranching community.

Ongoing outreach and dialog with ranchers in the planning area may be achieved through a variety of means. Community educational workshops should be organized by agencies and/or other groups that can offer expertise on habitat management and improving rangeland health. Similarly, demonstration tours should be held on ranches where conservative grazing management and other habitat improvement strategies are being implemented. Tours and workshops may also provide information regarding possibilities for diversifying ranch operations to include non-traditional sources of revenues. These might range from ecotourism and outdoor recreation, to mineral leasing outside of suitable and occupied habitat.

Another model for keeping landowners informed, and bringing them into the conservation planning process, is the "Ranch Conversations" program organized by the High Plains Partnership for Species at Risk and the Lesser Prairie-Chicken Interstate Working Group. This or similar programs aimed at keeping landowners informed and involved in maintaining at-risk species and rural lifestyles should be continued. (Detailed information regarding the Ranch Conversations program is currently available online at: http://www.westgov.org/wga/initiatives/HighPlains/Ranch%20Conversation%20final.pdf).

Agencies, particularly BLM and SLO, should also take the lead in educating oil and gas operators regarding the distribution, status, and needs of the LPC and SDL. It is essential that operators understand how their activities may affect species at risk. It is equally essential that individuals and companies in the oil and gas industry understand how and why they may be affected by any regulations pertaining to leasing and development, and how they can contribute through voluntary conservation efforts as described in Pathway Two.

To meet the varied educational and outreach needs associated with species conservation, agency resources should be coordinated with the organizational and educational capacities of coalition groups and non-governmental organizations such as the Quivera Coalition, the High Plains

Partnership, Rocky Mountain Bird Observatory, Playa Lakes Joint Venture, and others. The Eastern Plains Conservation Coordinator described in Pathway 8 should take the lead in developing broad partnerships among agencies and other groups, and in seeking funding that may be available for cooperative education and outreach projects.

An important educational need is for staff training for agency personnel involved in land management, conservation, and program funding decisions at local and regional levels. The Working Group specifically recommends that training workshops be organized for NRCS field staff and coordinators in the planning region, to keep this important group apprised of conservation issues and concerns regarding the LPC and SDL, and also regarding the various recommendations of the Working Group to seek Farm Bill - related funding for high priority conservation strategies.

Finally, the Working Group recommends that the principal agencies collaborate to provide an annual public report on the status of the LPC and SDL. BLM and/or NMDGF should take the lead on this, working with the monitoring/advisory committee of stakeholder representatives described in Pathway 2. Reports should be concise, up-to-date summaries of issues affecting the species, status and trends, and progress in implementing conservation strategies. They should be issued in writing and made publicly available, and also delivered as presentations in suitable public forums such as county commission meetings in the LPC/SDL planning area.

Pathway 8: Coordinating and facilitating participation in conservation efforts

The Eastern Plains Conservation Coordinator and the New Mexico Prairie Conservation Initiative

To carry on and coordinate the tasks of conservation strategy development and implementation, the Working Group has recommended that a position of "Eastern Plains Conservation Coordinator" be established and funded. The position may be part of a larger proposed entity, the New Mexico Prairie Conservation Initiative (NMPCI). This would be a non-profit organization, working in close collaboration with NMDGF and other agencies, dedicated to conserving the integrity and function of the southern Great Plains ecosystem of New Mexico while maintaining the culture and economic base of the region. Emphasis would be on recovery and conservation of the LPC and SDL, but also on playa lakes, Black-tailed Prairie Dogs, Aplomado Falcons, Sandhill Cranes, and other sensitive and imperiled components of the ecosystem. The Center of Excellence for Hazardous Materials Management, a 501©3 community development foundation in Carlsbad, New Mexico, has offered to help launch and establish the initiative.

Guiding principles of the NMPCI are:

- Ecosystem Management: Consideration will be given to the effects on both the structure and function of the ecosystem.

- Landscape Perspective: Habitat conservation will focus on identifying and conserving large, connected patches of important habitats.
- Adaptive Management: All management actions will be monitored and adjusted to maximize successful conservation.

It is envisioned that the Eastern Plains Conservation Coordinator would also serve as executive director of the NMPCI, working with a 10-member management board including representatives of the FWS, BLM, NRCS, NMDGF, NMSLO, oil and gas industry, ranching industry, conservation community, and sportsmen. The conservation coordinator / executive director, with the assistance of one or two conservation biologists, would be responsible for overseeing and facilitating implementation of conservation strategies for the LPC and SDL, and for raising funds needed to achieve strategy goals. Specific duties would include:

- Recruiting interested landowners for habitat conservation projects
- Assisting landowners with preparation of conservation plans and funding proposals
- Designing and implementing monitoring to determine success of habitat projects
- Planning and overseeing needed research
- Assisting management agencies in annual population surveys
- Ensuring each year that all habitat and population data are appropriately stored and analyzed for determining progress of efforts (see Pathway 2)
- Facilitating and supporting education and outreach
- Informing funding entities and interested stakeholders of achievements

NMPCI staff would also be involved in supporting and carrying out captive propagation efforts (see Conservation Strategy 4.2).

The Working Group views the Eastern Plains Conservation Coordinator as playing an essential role in facilitating implementation of collaborative conservation strategies proposed for the LPC and SDL. Agencies and NGOs active in the region should work together to establish and fund this much-needed position, either as part of the proposed NMPCI or within some other existing NGO structure.

Pathway 9: Funding

Many of the direct conservation and support strategies contained in Pathways 1-7 require significant funding in order to succeed. Indeed, the success of the Working Group process and of this entire Conservation Strategy for the LPC and SDL depends on each project element receiving adequate funding and support from an appropriate source. Potential funding sources and mechanisms have been identified for each of the conservation strategies in Pathways 1-4, and for important support efforts such as the formation of an Eastern Plains Conservation Coordinator position. In this section, additional information on potential funding sources is presented, and an overall strategic approach to LPC and SDL conservation funding is considered.

It should be emphasized that comprehensive conservation funding is a real and immediate need. To the extent that further habitat loss or deterioration occurs, or that species experience further population declines, the cost of species protection and recovery will only increase. These

expenses would likely be maximized in the event of federal listing, due to the need for agencies and the various parties they serve to comply with ESA regulations pertaining to all federal actions that might impact a listed species or its habitat. Direct or indirect costs of listing would be borne by all agencies and stakeholder groups. For this reason, the Working Group believes that quickly and adequately funding the projects and strategies presented in this document represents the most cost-effective solution for all parties—including taxpayers—to the problems of LPC and SDL endangerment in New Mexico.

Funding for carrying out conservation strategies may be provided by existing governmental funding or incentive programs, grant or cost-share programs maintained by non-governmental organizations or private funding entities, agency budgetary allocations, or specific project contributions from affected parties. In addition, significant programmatic funding could be made available by some novel mechanism requiring approval by the New Mexico State Legislature or by Congress. The Working Group believes that all of these sources are needed, and recommends a coordinated strategy aimed at maximizing advantage from existing programs, increasing agency budgets for LPC and SDL-related activities, and securing support from policy makers for the creation of new funding vehicles.

Existing governmental funding or incentive programs

Various federal programs sponsored by the FWS and the NRCS, and state programs sponsored by the NMDGF and NMSLO, are summarized in Table 3.1. Of all of these, the Working Group believes that the NRCS EQIP program carries the greatest potential for funding conservation strategies proposed in this document and urges local and regional NRCS staff to assist in helping make these funds available. Included in this category are stewardship incentive programs run by the NMSLO and BLM that offer reduced fees on grazing leases as a reward for achieving specified management objectives.

The Working Group recognizes that available funding is limited and competition is strong for the various existing federal and state programs that provide grants or cost-share support for habitat protection. Nevertheless, coordinated pursuit of these important funding sources can result in support for a number of projects, and should be a high priority for all parties involved in the implementation of this Conservation Strategy. The Working Group strongly recommends that:

- Granting agencies (FWS, NRCS, and NMDGF) together with the Eastern Plains Conservation Coordinator actively publicize and recruit participation in the various programs available, and assist with the formation of conservation partnerships and development of project proposals.
- State funds available through NMDGF-sponsored programs be increased.
- The state office of the NRCS should increase contact with landowners, and prioritize making more Farm Bill monies available for habitat conservation for declining wildlife species, especially those in danger of federal listing such the LPC and SDL.

Existing non-governmental programs

Various existing private or non-governmental programs that provide funding for conservation-related projects such as habitat restoration are summarized in Table 3.1. This list can and should be expanded. The Working Group recommends that the Eastern Plains Conservation Coordinator and/or personnel from BLM and NMDGF seek out and publicize all

non-governmental programs that provide grants, incentives, or cost-share assistance for habitat or species protection, and should facilitate participation in these programs by assisting with the formation of conservation partnerships and the development of project proposals. Funding from private foundations, conservation organizations, and other non-governmental entities may be used to secure additional governmental funding through partnership-based cost share programs.

Project contributions by affected parties

Conservation interests

Conservation organizations may engage in fundraising for specific undertakings, such as the acquisition of lands for LPC reserve areas. Organizations that specialize in these sorts of activities, such as the Nature Conservancy, may be encouraged to pursue partnership projects with agencies and private entities that will result in protection of sand shinnery or sand sage-grassland habitat. Conservation interests can also help provide and coordinate volunteer labor for habitat restoration projects on private lands, and can assist with education and outreach efforts.

Grazing interests

Ranchers typically make cost-share, in-kind contributions to match any Farm Bill or FWS funding they may receive.

Oil and gas interests

Private producers may be expected to bear the costs of mitigation and reclamation activities undertaken along with, or as a consequence of, energy exploration and development. In addition, industry may also voluntarily provide funds to support other proactive conservation efforts.

Agency budgetary allocations

A considerable portion of the total funding for LPC habitat management, conservation, research, and monitoring comes from budgetary allocations of BLM, NMDGF, and NMSLO. Both agencies support biologists and other staff with principal duties relating to the management of rangeland habitat, and both carry out LPC surveys, monitoring and habitat assessment, and outreach activities. The NMDGF owns and administers the LPC Prairie-Chicken Areas (PCAs).

The Working Group recognizes that for these agencies to carry out their needed role in the implementation of this Conservation Strategy, budgets for activities relating to LPC and SDL conservation will have to be increased. Nothing is more critical to success, in all of the conservation and support pathways, than adequate financial backing from the principal state and federal management agencies.

A specific recommendation is that NMDGF be mandated and funded to have a program to lease important habitat areas, and in limited circumstances purchase such areas from willing sellers, for the conservation of declining species or those facing possible federal listing. This program should include associated mineral rights where necessary and opportunities for matching donations from private sources or non-governmental organizations.

Other funding mechanisms

Apart from existing funding programs, project-specific contributions, and agency budgets, at least two different novel funding mechanisms have been discussed by the Working Group.

Request for Congressional approval of a special funding allocation. The Working Group believes that immediate and coordinated implementation of this Conservation Strategy could best be achieved through the establishment of a special federal funding source specifically for this purpose. The group believes that full and immediate funding for the conservation strategies it has proposed will result in a net savings of federal dollars, when compared to the direct and indirect costs of federal listing.

Request for state legislative approval of a new funding mechanism for wildlife conservation. The state program for conserving wildlife and avoiding federal listing of species is inadequately funded, depending largely upon monies from hunters' and anglers' license fees. Conservation representatives in the Working Group recommend that the New Mexico State Legislature create a new mechanism whereby all New Mexicans contribute consistently to the conservation of the state's native wildlife.

Table 3.1. Funding Sources for Conservation Activities.

Sponsor and Program	Type of funding	Type of activity supported	Deadlines	Key requirements and additional information
Federal Programs				
NRCS: Environmental Quality Incentives Program (EQIP)	Cost share; up to 75% contribution to the cooperator by the program.	Through participation in EQIP, agricultural producers may receive financial and technical assistance in developing and implementing conservation plans which include structural and management practices intended to treat a wide range of natural resource concerns. EQIP includes programs that enhance, restore, and manage fish and wildlife populations including such practices as rotational grazing, conservation buffers, prescribed burning, fencing, brush management, and grassland restoration.	The application evaluation period is established each year. All NRCS Field Offices and FSA County Offices will accept an applications for projects.	As of 2003, three NRCS offices (Clovis, Portales and Lovington) in NM employ this program for LPC habitat management. Incentives for LPC management are approved for anyone who is accepted into the program at the following rates: Clovis = $7.50/acre; Portales = $7.50/ acre; Lovington = $4.50/acre. www.nm.nrcs.usda.gov/programs/eqip.html
NRCS:Wildlife Habitat Incentives Program (WHIP)	Cost share; up to 75% contribution to the cooperator by the program.	WHIP is a voluntary program for people who want to develop and improve wildlife habitat primarily on private lands. It provides both technical assistance and cost share payments to help establish and improve fish and wildlife habitat. Projects could include including such practices as rotational grazing, conservation buffers, prescribed burning, fencing, brush management, and grassland restoration	No deadline for applications. Contact the local NRCS office.	All offices in NM can use WHIP funding for LPC habitat improvements. The NRCS National Office allocates annual funding to each state. www.nm.nrcs.usda.gov/programs/whip.html
NRCS: Grassland Reserve Program (GRP)	Cost share; up to 90% contribution to the cooperator by the program	Easements are purchased to maintain grassland habitats and prevent development such as urbanization. Wildlife species at risk are given extra points in the ranking. Contract items may not be specific to LPC habitat.	Contact local NRCS office.	www.nm.nrcs.usda.gov/programs/grp.html

Sponsor and Program	Type of funding	Type of activity supported	Deadlines	Key requirements and additional information
NRCS: Wetland Reserve Program (WRP)	Cost share; up to 100% contribution to the cooperator by the program.	Restoration of wetlands damaged in the past. Equal amounts of wetland and upland can be accepted into the program. Easements or cost-share are used to restore damaged wetlands. LPC may benefit in playa situations near leks.	Contact local NRCS office.	www.nrcs.usda.gov/programs/wrp/
NRCS: Conservation of Private Grazing Land (CPGL)	Technical assistance.	Provides technical, educational, and related assistance to private landowners, for better grazing land management; protecting soils, conserving water, and providing habitat for wildlife.	Contact local NRCS office	www.nrcs.usda.gov/programs/cpgl
NRCS/FSA: Conservation Reserve Program (CRP)	Cost share; up to 50% contribution to the cooperator by the program.	Cropland on highly erodible land is retired and planted to permanent habitat for wildlife. A portion of the program is devoted to buffers along streams and applies to rangeland. Adjustments to the program allow for limited grazing. New contracts for wildlife habitat require planting native plant mixes, including grasses for LPC nesting.	No deadline for applications for the buffer program. Contact local county FSA office.	www.fsa.usda.gov/dafp/cepd/crp.htm
NRCS/FSA: Conservation Reserve Enhancement Program (CREP)				
NRCS/FSA: Debt for Nature Program	Cost share; up to 100% contribution to the cooperator by the program.	Debt reorganization program to forgive debts owed on farm and ranch loans. In exchange for placing a portion of the affected land in an easement for wildlife habitat, the owner will be allowed to eliminate the debt on that land. Management of the affected land can be assigned to NMDGF, FWS, NRCS or others.	Contact local FSA office.	Contact local FSA or NRCS offices or USDA Service Centers. www.fsa.usda.gov/pas/publications/facts/html/dfn01.htm

Sponsor and Program	Type of funding	Type of activity supported	Deadlines	Key requirements and additional information
FWS: Partners for Fish and Wildlife Program	Cost share; up to 90% contribution to the cooperator by the program. Maximum of $25,000 per project	The Partners Program provides technical and financial assistance to private landowners and their non-federal partners to voluntarily restore wildlife habitats on their land.	Applications reviewed in fall, funding decisions made in spring of each year.	http://partners.fws.gov http://partners.fws.gov/pdfs/NM-needs.pdf
FWS: Private Stewardship Program	Cost share; up to 90% contribution to the cooperator by the program.	This program focuses on conservation efforts that protect federally listed, proposed, or candidate species, or other at-risk species.		http://endangered.fws.gov/grants/private_stewardship.html
FWS: High Plains Partnership (HPP)	Variable; Other federal and state programs provide funding through the HPP	Projects on private lands designed to improve the status of High Plains species at-risk so as to reduce or remove their need for protection under ESA.	Variable	Contact FWS. http://mountain-prairie.fws.gov/endspp/hpp/
BLM: Challenge Cost Share Program	Matching cost share(1:1 non-federal match) with appropriated funds	Activities include habitat improvement, studies, and surveys.	Part of BLM budget process, proposals normally have to be submitted a year in advance normally by June.	Interested parties can contact the appropriate BLM field office where the activity is proposed.
State Programs				
NMDGF/FWS: Landowner Incentive Program (LIP)	Grant payments with need for matching funds and/or reimbursement of actual expenses	Activities eligible for funding includes removal of exotic plants, fencing to enhance important riparian habitats, land restoration to protect habitats and improve the environment for native plants and wildlife, and long-term conservation easements	Variable	States are required to provide a minimum of 25 percent non-federal share of program costs to support their programs. These funds may be provided by the state, landowner or other conservation partners. http://southwest.fws.gov/fedaid/lip.html http://southwest.fws.gov/fedaid/lip2.html

Sponsor and Program	Type of funding	Type of activity supported	Deadlines	Key requirements and additional information
NMDGF: New Mexico Habitat Stamp Program	Cost share	The program is primarily geared toward projects that enhance wildlife populations and habitat.	BLM and Forest Service submit projects through NMDGF coordinator two years in advance.	Projects are sponsored by agencies using funding provided through a habitat stamp program. www.gmfsh.state.nm.us/PageMill_TExt/Hunting/hstamp.html
NMDGF: Non-game Share With Wildlife	Grant	The program funds four general categories: research, public education, habitat protection, and wildlife rehabilitation.	Variable	www.gmfsh.state.nm.us/PageMill_TExt/NonGame/swwh.html
NMSLO: Land Maintenance Fund	Cost share	Habitat improvements, surveys and research	Variable	www.slo.state.nm.us
NGO programs and foundations				
National Fish and Wildlife Foundation (NFWF) Grants	Cost share, grant	Conservation of fish & wildlife and the habitat on which they depend; projects that work proactively to involve other conservation and community interests; projects include such things as habitat improvements, studies, surveys.	Pre-proposals June 1 and October 15. Full proposals 6 weeks later.	Requires non-federal 1:1 match in dollars or in-kind services. www.nfwf.org/programs/programs.htm
Playa Lakes Joint Venture (PLJV) Cons. Grants	Cost share, $25,000/year limit	Conservation projects in three categories: habitat management, research, and outreach.	November 15 and March 15	1:1 match required, greater contribution from project partners preferred. http://www.pljv.org/conservation04.html
Conservation Fund Conservation Program	Grants and assistance programs	The Fund provides a comprehensive range of conservation services to government agencies, corporations, foundations, nonprofit organizations, and individuals. Projects include land identification and acquisition, mitigation and disposition, management advice, and training.	Variable	http://www.conservationfund.org/

Chapter Five: Recommendations for Sand Dune Lizard Conservation

5.1 Strategy orientation

Conservation recommendations for the SDL were formulated by a subcommittee of stakeholders and SDL biologists, and approved by the entire Working Group. The format of these recommendations differs from that of the conservation Pathways presented in the previous chapter. However, strategies for the LPC and SDL should not be considered in isolation from one another. Many elements of the conservation Pathways contained in Chapter 4 integrate with, and can help achieve implementation of, the additional specific recommendations made for the SDL. Recognizing areas of geographic overlap and common conservation needs, the Working Group discussed and formulated a number of strategies with both candidate species in mind. The goal has been a coordinated conservation strategy for at-risk species in the sand shinnery ecosystem.

Ways in which in the SDL recommendations interface with Pathway strategies from Chapter 4 are noted for each item in section 5.3 below. Beyond these specific areas of overlap relating to the SDL recommendations, additional broad Pathway elements apply to both the SDL and the LPC. These were noted in Chapter 4. The pursuit of a coordinated conservation strategy that takes into account the needs of both candidate species can be facilitated by the development of:

- The development of Candidate Conservation Agreements with Assurances (CCAAs) as described in Pathway Three, Conservation Strategy 3.4;
- Implementation of coordinated education and outreach as described in Pathway 7;
- Implementation of the proposed Eastern Plains Conservation Coordinator position described in Pathway 8;
- Provision of necessary and sufficient funding as described in Pathway 9.

See all of the above sections for further details.

5.2 Landscape analysis and ongoing research

The BLM is cooperating with researchers from Texas A&M University and NMDGF to conduct a landscape analysis of SDL habitat in southeast New Mexico. This work, along with additional biological studies, will provide a broader view of how occupied, suitable, and potential habitat areas for SDLs are arranged across the landscape. The range-wide analysis will enable land managers to identify and map critical areas of SDL habitat, plan for dispersal corridors, and classify potential threats to lizard populations. The studies are focused on understanding SDL distribution and key habitat characteristics, and will result in GIS maps with habitat and land use information, and habitat suitability analyses. As with the LPC, these tools

will provide an effective mechanism with which to assess and monitor potential impacts on SDL populations. The current round of studies was initiated in the fall of 2004 and will continue through 2006.

The conservation recommendations contained in section 5.3 below make frequent reference to suitable and occupied habitat for the SDL. Pending precise definition and range-wide mapping of these areas, as described above, the terms should be understood to refer to locations identified by biologists as SDL population areas, and to shinnery oak dune areas having the characteristics of suitable habitat described in Chapter Three, section 3.7. (See Map 2 for general distribution of the SDL.)

5.3 SDL management recommendations *in order of priority*

NOTE: Research on the SDL is ongoing. The following recommendations reflect and are based upon the best available knowledge at the time they were written. As research continues and as new information becomes available, these recommendations should be adjusted and refined.

1. Threat: Application of herbicide (i.e., Tebuthiuron) for shinnery oak control in suitable or occupied habitat

Recommendation

All tebuthiron spraying for shinnery oak control within 500 m of occupied or suitable habitat should be discontinued. Proposals for spraying of shinnery oak with non-tebuthiron herbicides or defoliants within 500 m will be reviewed by the SDL research team (biologists from NMDGF, BLM, or other relevant agencies).

Justification

Comparisons between Tebuthiuron treated and adjacent untreated shinnery oak habitat in the Mescalero Sands showed 70-94% reductions of SDL numbers in the treated pastures compared to the untreated pastures. Information on the effects of herbicide treatment on shinnery oak and SDL populations is found in Gorum et al. (1995) and Snell et al. (1997).

Wind and other variables can cause "overdrift" or "overspray" of chemicals that are broadcast through aerial application. To prevent this "overspray" from reaching occupied habitat, buffers of at least 500 m need to be established around occupied or suitable SDL habitat.

Coordination with other strategies

Shinnery oak management with respect to the LPC is addressed in Chapter 4, Conservation Strategy 1.4, "Shinnery oak management." Guidelines for limited use of herbicide as a tool for LPC habitat improvement reiterate that herbicide treatments should never be applied in dune areas or in corridors between dune complexes.

2. Threat: Application of herbicide (i.e., Tebuthiuron) for shinnery oak control in SDL dispersal corridors

Recommendation

Dispersal corridors of unsprayed shinnery oak flats at least 500 m wide should be retained between suitable habitat, both occupied and unoccupied, that is separated by ≤ 2000 m.

Justification

Monitoring of pitfall traps (Painter and Fitzgerald, *unpubl. data*) suggests the interdune, shinnery oak "flats" are important as dispersal corridors for juvenile SDLs and for females seeking egg deposition sites. Continued monitoring will establish when these areas are the most important, and if they are used by dispersing adults as well. A minimum corridor width of 500 m was established by consensus among experts. However, some individuals queried (L.A. Fitzgerald and H.L. Snell, *pers. comm.*) suggested that because sand dunes are a dynamic feature that move across the landscape through time it would be imprudent to consider any currently unoccupied patches of suitable habitat within the overall range or along the edge of the range as being useless to SDLs.

Coordination with other strategies

As described in SDL Threat 1, above.

3. Threat: Oil/gas exploration and extraction activities in dunal areas

Recommendation

New oil/gas well pads should not be placed in dunal areas within occupied or suitable habitat, or within 100 meters of such dunal areas. Well sites proposed in these areas should be moved to adjacent shinnery oak flats. Where a dune complex that contains occupied or suitable habitat is large (>5 acres) and there are compelling reasons, such as New Mexico Oil Conservation Division (NMOCD) requirements that may not be alleviated, new well pads should be located at the periphery of the complex, avoiding the center of the complex. See Appendix B for a description of suitable SDL habitat.

Justification

Based on long-term monitoring of the species, stable populations of SDLs are known to occur only in blowout areas within shinnery oak habitat (Degenhardt et al. 1996; Fitzgerald et al 1997). Oil/gas wells and the associated caliche roads and well pads remove suitable habitat for SDLs. Oil and gas industry representatives have some concern about this recommendation because of the unknown extent of the size of dunal areas to be included. Mapping of dunal areas is underway, as described in section 5.2 above. Industry will review all maps upon completion and affirm their agreement to this recommendation.

Coordination with other strategies

Where the ranges of the LPC and the SDL overlap, this recommendation is consistent with and can be pursued through strategies presented in Chapter 4, Pathways 2 and 3.

- In Conservation Strategy 2.1, "Recommended guidelines for new mineral leasing," it is recommended that the existing policy of no new mineral leasing in the Roswell BLM Core Management Area (CMA) be continued. This would reduce potential development impacts in dunal areas in the large portion of the SDL range that falls within the CMA.

- Also in Conservation Strategy 2.1, additional areas of suitable and occupied LPC habitat are recommended for deferral of new leasing. This would reduce potential development impacts in an additional portion of the SDL's range where its distribution coincides with LPC habitat.
- In Conservation Strategy 2.2, "Minimizing impacts of new and ongoing energy development," strategies for managing existing leases and mitigating development impacts in suitable and occupied LPC habitat are discussed. These may also apply to SDL habitat.
- In Conservation Strategy 3.1, "Land and mineral exchanges to consolidate federal holdings in BLM core management areas," a program of land exchanges is recommended that would add to BLM holdings in the CMA. This would increase the benefit of the CMA to the SDL as described above.
- In Conservation Strategy 3.2, "Options for acquiring or designating lands for LPC reserves," the establishment of several LPC reserves is recommended. Such a reserve might also protect SDL habitat from potential development disturbance.

4. Threat: Oil/gas exploration and extraction activities–well pad density

Recommendation

Establishment of oil and gas well pads within complexes of suitable habitat should be limited so that total well pad density does not exceed 13 well pads per square mile (not to be confused with section lines).

Justification

Sias and Snell (1996) studied population densities of SDLs at various distances from active oil/gas wells. They found a statistically significant pattern of greater numbers of SDLs occurring at the Far Plots (200-220 m from well pad) compared to the Adjacent Plots (10-30 m) and the Intermediate Plots (50-70 m). They reported a mean 39.8% reduction in the SDL population density index in the Adjacent Plots when compared to the Far Plots, and a mean 38.9% reduction in the SDL population density index in the Intermediate Plots when compared to the Far Plots. These data provide evidence to conclude that oil and gas wells result in a localized reduction in lizard populations. The specific mechanisms of the observed reductions are unknown at this time (although may include habitat loss and fragmentation and H_2S toxicity); however, a lower well density will result in a lower proportion of habitat having conditions found in the Adjacent Plots, where population density of SDLs is reduced.

Well density of 13.64 w/mi^2 results in a predicted population reduction of 25%. SDLs were found throughout oil and gas fields, but overall population levels were 31-52% lower in oil and gas fields compared to undeveloped areas. In areas with the highest well densities (34.36 w/mi^2) regression analysis predicted a 56% decline in SDL population levels (Sias and Snell 1998). Large-scale reductions in this species habitat will lower the probability of continued survival of the species.

Coordination with other strategies

As described in SDL Threat 3, above.

5. Threat: Oil/gas exploration and extraction activities – well pad size and reclamation

Recommendation

New well pad construction in occupied or suitable habitat should be kept to a minimum, and the working area of the pad should be minimized (although opportunities to drill multiple wells from one pad should take precedence). Abandoned well pads and the caliche roads that serve these wells should be cleaned of caliche, raked, contoured, and reclaimed with native sand. All out-of-service roads in occupied and suitable habitat should be reclaimed and closed to vehicle use, pending consultation with grazing permittees. Abandoned well pads and out-of-service roads should not be reseeded in dunal areas. BLM should identify ways to redistribute or stockpile caliche for future road maintenance or other uses.

Justification

Adherence to these recommendations will minimize habitat loss.

Coordination with other strategies

Strategies for mitigating development impacts and coordinating restoration and reclamation of previously developed areas are described in Chapter 4, Conservation Strategies 2.2 and 2.3, "Coordinating restoration and development of previously developed areas." These strategies may also apply to SDL habitat and are consistent with implementing this recommendation.

6. Threat: Off Road Vehicle (ORV) use

Recommendation

ORV use in occupied or suitable habitat should be limited to currently established ORV recreational areas and no new ORV recreational areas should be established within sandy areas within the geographic range of the SDL. ORV use should continue to be allowed for permitted purposes, using existing designated roads wherever possible.

Justification

Heavy recreational ORV use in arid sand dunes is known to be injurious to wildlife and its habitat (Bury and Luckenbach 1983), and has been specifically identified as one of the primary threats to other species of dune-endemic lizard species (e.g., fringe-toed lizards).

Coordination with other strategies

Strategies for minimizing ORV impacts in LPC habitat are discussed in Chapter 4, Conservation Strategy 5.2, "Reduce vehicular mortality and disturbance through road closures and ORV management," and are consistent with the implementation of this recommendation.

7. Threat: Oil/gas exploration and extraction activities – use of "thumper trucks" for seismic exploration

Recommendation

Repetitive use of "thumper trucks" (> once per 5 years) should be avoided unless poor results or new technology dictate that new surveys are needed. Thumper trucks should avoid

dunal complexes when feasible. Management (regulations, signage, barriers) should assure that two-tracks created by thumper trucks are not used as ORV roads.

Justification

SDLs are generally inactive from October to April. During hibernation or seasons of inactivity, they are immobile and unable to move about. Use of "thumper trucks" in occupied habitat during these periods of inactivity could result in direct take of SDLs. Direct take could also occur during summer months when lizards are laying eggs in underground nests that could be crushed. While repetitive thumper truck activity increases the risk of harm to lizard populations, there may be some benefit in limited seismic exploration as a way of focusing drilling activity and reducing the overall number of new well pads.

Coordination with other strategies

Management of existing leases in LPC habitat is discussed in Chapter 4, Conservation Strategy 2.2.

8. Concern: Lack of public awareness of the conservation and management needs of the SDL

Recommendation

The BLM, NMDGF, and FWS should develop a public awareness program to help disseminate information on the habitat requirements and status of the SDL. Representatives of the ranching community and the oil/gas industry should be well informed about this program, and can help to disseminate this information to others within those industries.

Justification

An accurate and unbiased compilation of the management needs of the SDL would help the public and industry understand the regulations and laws governing management by federal and state agencies, and proactively assist in precluding adverse impacts to the SDL and its habitat.

Coordination with other strategies

Education and outreach strategies regarding the LPC are described in Chapter 4, Pathway 7. These strategies also apply to, and should be coordinated with, efforts to increase public awareness of the conservation and management needs of the SDL. Coordinated education and outreach should focus on the needs of at-risk species in the sand shinnery ecosystem.

9. Concern: Oil and gas facilities maintenance and operation activities

Recommendation

Regular pipeline inspection and routine maintenance of wells should occur. Oil and gas wells and storage facilities should include safety measures to ensure operations that minimize the potential for habitat pollution in the form of oil leaks or spills. Such measures should include, but not be limited to, replacement of worn or out-of-date materials and equipment, construction of spill containment structures, removal of contaminated materials, and protection of well sites.

Justification

Regular inspection and maintenance of wells and storage facilities will minimize possible oil and gas well pollution. Although expected to be minimal, the effects of oil and gas field pollution on SDLs have not been quantified, but control or reduction (at least to the extent required to address human health and safety concerns) of this pollution would be prudent to alleviate potential threats.

Coordination with other strategies

Recommendation not specifically addressed elsewhere.

5.4 Recommendations for further research

There are several areas in which further research would provide data that can help in making management decisions to benefit the species. It is recommended that research efforts include a "joint fact-finding" component, in which study parameters are developed in collaboration among biologists, industry, conservationists, and agencies. All experimental reclamation efforts should be reviewed and monitored on a regular basis.

A. Concern: Tebuthiron treatment

Research Recommendation

Continue to study areas previously treated with tebuthiron spraying to determine whether SDL populations have expanded to occupy the site. If there is no occupation, examine whether there can be habitat modification at the edge of the site that might result in occupation.

B. Concern: Engineering habitat

Research Recommendation

Examine opportunities for engineering land forms to create sand dune blowouts that can sustain SDLs. Determine whether caliche removal is successful in recreating habitat. Experiment with caliche removal and on-site burial to determine feasibility and adequate depths.

C. Concern: Mitigation of development impacts

Research Recommendation

Conduct research to determine if selective site-specific planning of infrastructure within dunal complexes can minimize development impacts such that the 13 well pads per square mile limitation could be increased.

Justification

If research findings demonstrate that on-site or off-site mitigation of impacts is possible, these measures could be applied when exceptions to the 13 wells/m^2 is necessary or proposed.

D. Concern: Mapping

Research Recommendation

Prioritize completion of habitat mapping to identify occupied and suitable SDL habitat.

E. Concern: Public education

Research Recommendation

Demonstrate that an effective public awareness program can lead to increased funding for SDL research and conservation initiatives.

Additional concerns that might warrant research at a later date include:

A. Concern: Oil/gas exploration and extraction activities–Hydrogen Sulfide (H_2S) emissions

Recommendation

Control measures to minimize or reduce H_2S emissions should be implemented at all well sites. Laboratory and field studies designed to identify and investigate the impacts of H_2S emissions should be implemented.

Justification

H_2S emissions are known to be toxic to wildlife, although the effects on SDLs are unknown. Until these potential effects to SDL populations can be quantified and further understood, it is prudent to control or reduce these emissions.

B. Concern: Livestock use

Recommendation

Research should be designed and implemented to study the potential impacts of livestock grazing on the SDL and its habitat. The BLM, ranching community, and NMDGF should cooperate in designing and implementing these studies.

Justification

Virtually nothing is known about the potential direct impacts of livestock grazing on the SDL and its habitat, therefore it is prudent to implement this research to determine at what grazing levels, if any, that negative impacts exist.

C. Concern: Use of management-ignited fires or wildfires

Recommendation

Research should be designed and implemented to study the potential impacts of management-ignited fires or wildfires on the SDL and its habitat. BLM, the ranching community, and NMDGF should cooperate in designing and implementing these studies.

Justification

Virtually nothing is known about the potential direct impacts of management-ignited fires or wildfires on the SDL and its habitat, therefore it is prudent to implement this research to determine to what extent, if any, that negative impacts may result from fire.

Chapter Six: Moving toward implementation

This concluding chapter briefly summarizes the accomplishments of the Working Group to date, and outlines how the collaborative conservation process will now move forward to achieve implementation under the guidance of this document and a designated Implementation Team.

6.1 Completion of Phase I: The LPC/SDL Conservation Strategy document

This LPC/SDL Conservation Strategy was completed and approved by the Working Group in May, 2005. It is considered to have utility and applicability over a five-year time frame, from 2005 - 2010. During or after that period the strategy may be revised, amended, or supplanted by additional strategic and operational planning documents produced in ongoing collaborative conservation efforts.

The strategy document outlines and prioritizes a variety of recommended programs, projects, and practices for reducing threats to the LPC and SDL, while maintaining other uses of the land. It is the result of two years of discussion and give-and-take negotiation among stakeholders. For all represented parties, it contains elements that were not considered desirable, but in the end were found acceptable, in the spirit of shared goals and collaborative problem-solving.

The strategy document identifies and addresses all principal known threats to the LPC and SDL. It is comprehensive in scope, and is offered with expectation that, when implemented, it will produce real benefits for the species concerned. It also addresses the concerns and needs of land users and property owners represented in the Working Group process, and emphasizes that for collaborative conservation to be successful, these concerns and needs must be fully taken into account.

The strategy does not spell out all aspects of how, where, and when the various recommendations will be implemented. This work still lies ahead, following the detailed strategic direction that has now been set. To move forward, the strategy asks for, indeed requires, the ongoing, active participation of all parties. A high level of involvement will be essential to the development of detailed operational planning and implementation. Members of the Working Group now bear a responsibility in carrying out the various actions the strategy recommends and to which they have agreed.

The strategy has been approved and endorsed by the Working Group, with some qualifications as reflected in the text. The LPC and SDL strategy chapters 4 and 5 have been submitted to the BLM for consideration in the current Resource Management Plan Amendment process for southeast New Mexico. The strategy as a whole should be considered the first step towards the establishment of conservation efforts sufficient to meet FWS PECE criteria, in the event that federal listing of the LPC or SDL is considered at some future date.

Publication of this strategy document marks the completion of Phase I and sets the stage for Phase II, strategy implementation.

6.2 Conclusion of the Working Group process and the role of the Implementation Team

The final Phase I meeting of the Working Group was held on May 5, 2005. The Working Group process associated with Phase I planning was concluded upon final approval and publication of the conservation strategy document.

At the final meeting an Implementation Team was established, to carry on the collaborative conservation efforts of the Working Group. The Implementation Team consists of two members from each of the principal agencies and stakeholder groups. Its function and duties are described below. The initial composition of the Implementation Team is included in Appendix B.

6.3 Phase II: Responsibilities of the Implementation Team

The Implementation Team has been established to ensure that the progress of the Working Group to date is carried forward, and that strategic recommendations are followed by concrete actions. Ultimately, successful LPC and SDL conservation depends not on the contents of a strategic plan but on the breadth and effectiveness of programs, projects, and practices implemented on the ground.

It is essential that strategy development and implementation not be viewed as the responsibility of the Implementation Team alone. The team is composed of a small number of individuals, a subset of the original Working Group. Conservation success will require the participation of a much larger group of regional planners and decision-makers, agency managers and scientists, constituency group members, and private parties. However, the Implementation Team has a crucial role to play in maintaining the open and collaborative nature of ongoing conservation efforts, and in making sure that Working Group agreements are being honored and strategies are being pursued.

Responsibilities of the Implementation Team fall into three broad categories: communication and coordination, operational planning, and strategy implementation. Various duties and functions in each of these categories are listed below. These lists are not intended to be exclusive or comprehensive. It is expected that the role played by the Implementation Team will evolve over time. Few of these functions can be achieved by the team acting alone; interaction with agencies and stakeholder groups is implicit in many of the items that follow. In such cases the team's role is to provide the encouragement, direction, and coordination needed for directives to be realized.

At the final meeting of the Working Group, it was suggested that one of the first tasks of the Implementation Team should be to consider possible ways of establishing a more formal status under some state-chartered authority. Team representatives agreed to think through what might be the best institutional format for such a charter group, and work toward attaining such status.

Communication and coordination

- Maintain active communication among Working Group constituencies. This includes use of established Working Group mailing and email lists to keep parties informed of developments, meeting dates, and other matters.
- Establish and/or serve as a clearinghouse for information concerning LPC and SDL conservation efforts.
- Organize and direct special committees that may be appointed to carry out specific research or planning tasks. Communicate the results of such committee work to all interested parties.
- Liaison with the FWS regarding the progress of conservation efforts. This includes the monitoring and framing of efforts with regard to PECE criteria.
- Convene meetings as necessary. At minimum, this shall include an annual meeting for reporting progress and exchanging information regarding all aspects of LPC and SDL conservation. This should be open and made known to all interested parties. It should include discussion of both progress and setbacks regarding the goals of species management and land user protection.
- Prepare and distribute to all interested parties an annual progress report on the implementation of conservation efforts. This should include an updated list of achievements, projects, schedules, and timelines for all participating entities. A template for this annual report is provided by the table summarizing progress to date, in Appendix A of this document.

Operational planning

- Establish overall criteria for success in conservation efforts. This is an important task to which the Working Group has already given much attention. It should be a top priority for the Implementation Team. As discussed in Chapter 4, Pathway 6, overall measures of success are needed for the conservation strategy as a whole. The questions, "where are we going?" and "how will we know when we get there?" must be answered in terms of specific, measurable criteria. While species conservation is an inherently open-ended process, parameters for "successful" conservation can be set based on a combination of scientific understandings of species population biology and value judgments regarding acceptable levels of risk, and probabilities of survival over some agreed-upon interval of time. Ongoing collaboration between scientists, land managers, and land users will be essential to this process.
- Establish immediate action priorities for LPC Pathways and SDL conservation recommendations.
- Establish and/or refine specific goals and objectives for conservation strategies. Agencies may take the lead in this, but goals and objectives should be established through discussions with all affected parties.
- Establish project-specific timelines and budgets. This applies particularly to agency-directed projects, which must be incorporated into internal planning processes.
- Prepare an implementation plan summarizing all of the above. Further planning is not the top priority, but a detailed implementation plan should be developed as work proceeds.

Project implementation

- Work with agencies to develop institutional capacities for necessary research, monitoring, evaluation, and data management.
- Initiate conservation projects and partnerships.
- Seek to acquire funding.
- Oversee and coordinate action on all strategies.

6.4 Phase II: Responsibilities of the Working Group

- Maintain communication within and across constituencies, and with the Implementation Team.
- Promote the Phase I LPC/SDL Conservation Strategy, and the recommendations it contains, to constituency members outside the Working Group.
- Take steps to carry out recommended implementation actions, as directed to each participating entity.
- Initiate conservation projects and partnerships.
- Seek to acquire funding.
- Agencies should seek to develop institutional capacities for necessary research, monitoring, evaluation, and data management.
- Report all strategy-related projects and changes in on-the-ground conditions to the Implementation Team.

6.5 Implementation progress to date

Over the two year time period that the Working Group has been meeting, and while the strategy document was being crafted, a number of specific actions have been taken to help reduce threats to the LPC and SDL. Some of these were stimulated by Working Group recommendations; others came about through independent processes. Of particular significance are the extensive biological research, habitat analysis, and mapping efforts currently underway or recently completed; deferral of new mineral leasing on NMSLO lands in occupied LPC habitat; acquisition of an extensive tract of prime LPC habitat by an NGO; protective BLM management of suitable and occupied LPC and SDL habitat; and initiation of planning for a LPC captive breeding facility at the WIPP site. These and other actions represent a significant first step toward reducing threats faced by the LPC and SDL.

A tabular summary of actions completed or in progress at the approval date of the Conservation Strategy, May 2005, is presented in Appendix A. The summary contains an entry for each numbered LPC conservation strategy from the Pathways in Chapter 4, and each SDL recommendation from Chapter 5. Such reporting is recommended on an annual basis, as discussed in section 6.3 above.

The Working Group concludes its Phase I efforts with the anticipation of lengthening annual reports of conservation progress and success in the coming years.

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Appendices

Appendix A: Actions Completed or Underway

Progress report on LPC conservation activities, 2003 - 2005

Pathway/ Strategy	Strategy Description	Action Item/Parties Involved	Status of Action
1.1	Conservative grazing management with compensation for ranchers	50% voluntary reductions in livestock use on BLM Core Management Area (CMA) allotments of the Roswell Field Office (RFO)	One allotment in 2004
		BLM Carlsbad Field Office (CFO) working with permit holders on 5 allotments to develop measures that include rest rotation and mesquite control	Initiated in FY2005
		NRCS Portales Office EQIP funding for LPC habitat improvement through deferred grazing and other measures:	2003: 3 contracts, 46,380 acres, $259,160 2004: 2 contracts, 9,323 acres, $69,871 2005: 1 contract, 6593 acres, $54,598
		NRCS Portales Field Office Wildlife Habitat Improvement funding for playas in Curry, Roosevelt and Lea counties. Extra points for landowners with LPCs within 2 miles of playa.	Initiated in 2005. 1 contract, 372 acres, $22,770
1.2	Enhanced CRP	Discussions ongoing	Ongoing

Pathway/ Strategy	Strategy Description	Action Item/Parties Involved	Status of Action
1.3	Mesquite control	BLM CFO-Mesquite control in 5 allotments in LPC habitats	Initiated FY05
		FWS Private Stewardship Grant Program partnership project with Grasslans Charitable Foundation and Phalarope Consulting for mesquite control and planting of native grasses	$153,000 grant awarded 2005
		FWS Partners Program mesquite and cholla control projects with NMSLO and private landowners	Completed or ongoing
		NRCS EQIP projects, see above	
1.4	Shinnery oak management	BLM—Interseeding desirable native grasses in shinnery oak habitats	Ongoing
		Playa Lakes Joint Venture and The Nature Conservancy grant to use patch burning to try to increase dominance of native grasses	$40,000 grant awarded

Pathway/ Strategy	Strategy Description	Action Item/Parties Involved	Status of Action
2.1	Guidelines for new mineral leasing	NMSLO deferred leasing (for unleased areas) in occupied LPC habitat	Established and ongoing; to be reviewed in 2007
		BLM deferred mineral leasing in LPC/SDL habitat in CMA	Ongoing
		BLM interim management guidelines to protect LPC and SDL habitat during the Resource Management Plan Amendment process	Established 2004 and ongoing until RMPA is complete
		Baseline habitat suitability map for the PPA	Complete FY2005
		Statistical review of lek monitoring to detect trends	Initiated FY2005
		Suitability analysis of 17 Carlsbad areas	Initiated FY2005
2.2	Minimizing impacts of new and ongoing energy development	BLM requiring Plans of Development (PODs) in key habitat areas to minimize surface disturbance and fragmentation. Completed 18 PODs in CFO and 3 PODs in RFO to minimize surface disturbance for LPC and SDL	Initiated FY2004 and ongoing in FY2005
		BLM and industry working to implement improved reclamation procedures on current wells, roads, and rights-of-way	Ongoing
2.3	Coordinate restoration and reclamation of previously developed areas	BLM program to reclaim Pre-NEPA roads, well pads, rights-of-way, etc. FY04 accomplishments include reclamation of approximately 15 well pads and 3 miles of road. FY05 pursuing coordinated efforts with NRCS for reclamation and vegetative manipulation projects	Initiated FY2004 and ongoing in FY2005

Pathway/ Strategy	Strategy Description	Action Item/Parties Involved	Status of Action
3.1	BLM/SLO exchanges	BLM RFO has forwarded listing of State Land parcels for possible exchange to the BLM State Director	Initiated FY2005
3.2	Establishing LPC reserves	The Nature Conservancy purchase of 18,5000-acre Creamer Ranch property near Milnesand, in area of prime habitat and high LPC density	Complete in 2004
3.3	Comprehensive Management of PCAs	BLM developed alternatives for managing Federal minerals in PCAs as part of its regional Resource management Plan Amendment (RMPA)	Initiated FY2005
3.4	Develop CCAAs	Meetings with agency representatives to discuss development of CCAA in association with future LPC reintroduction at Brininstool Ranch Discussions with landowners and NMSLO to develop CCAAs regionally on non-federal lands Agency discussions of mechanism to provide CCAA-equivalent "assurances" on federal allotments and leases	Initiated FY2005 Initiated and ongoing Initiated and ongoing
4.1	Manage and restore potential habitat in SE NM (IPA)	Biological inventory and habitat assessment of IPA	Initiated and ongoing
4.2	Captive propagation program	Planning for LPC captive propagation facility at WIPP Brininstool Ranch identified as future LPC reintroduction site, with landowner and agency support	Initiated and ongoing Site ID complete, discussions ongoing
5.1	Predator control	Reduce LPC mortality by controlling predators	Ongoing

Pathway/ Strategy	Strategy Description	Action Item/Parties Involved	Status of Action
5.2	Road closures and OHV management	Unless otherwise designated, ORV use limited to designated roads or trails in the BLM Roswell Field Office	Ongoing
		Road designations in BLM Roswell and Carlsbad Field Offices are being evaluated in ongoing Resource Management Plan Amendment	Initiated FY05
5.3	Reduce unlawful hunting	NMDGF education efforts	Ongoing
5.4	Plant grain crops in select areas		
6	Research	Maintained or increased LPC roadside surveys by NMDGF, BLM, NMSLO	Ongoing
		BLM Carlsbad Field Office tested use of helicopter to locate LPC over approximately 100,000 acres in 2 days	Initiated in FY2005
		BLM habitat monitoring in LPC nesting and brooding areas	Ongoing
		Sutton Avian Research Center continuing research on LPC habitat and nesting	Ongoing
		Auburn University and BLM research on ways to establish new lek sites within LPC historic range	Ongoing

Pathway/ Strategy	Strategy Description	Action Item/Parties Involved	Status of Action
6 (cont.)	Research	NMDGF, FWS, and Grasslans Charitable Foundation research trapping, tracking and monitoring LPCs to determine habitat use on Milnesand Prairie Preserve (Creamer Ranch)	2004-present
		NMDGF, Grasslans Charitable Foundation and Charles Dixon conducting studies of LPC response to herbicide treatment of shinnery oak on private lands	2000-present
		Texas Tech University graduate student project on nesting response to herbicide treatment	Ongoing
7	Education and Outreach	High Plains Prairie-Chicken Festival in Milnesand	Annual and Ongoing
		Outreach presentations by Tish McDaniel / Phalarope Consulting to Soil and Water Conservation Districts, schools and other groups	2003 – present
		Presentations to over 100 students about prairie grassland conservation issues, including SDL and LPC, at the Living Desert State Park	FY2005
		Ongoing communication between agency and oil and gas representatives about need and opportunities for LPC and SDL conservation	Ongoing
		Agency discussions with the Eddy County Board on LPC and SDL issues and conservation strategies	FY2005
		Agency discussions with rural electric cooperatives on SDL and LPC issues	FY2005

Pathway/ Strategy	Strategy Description	Action Item/Parties Involved	Status of Action
8	Coordination of Conservation Efforts	BLM Resource Management Plan Amendment addressing special status species with focus on Sand Dune Lizard and Lesser Prairie-Chicken	Under development 2005
		Planning under way to establish New Mexico Prairie Conservation Initiative, housed at the Center for Excellence in Carlsbad, NM	Launched in 2004 and ongoing
		Partnership projects between agencies and NGOs	Various, completed and ongoing, See examples above.
		Implementation Team established to advance goals and objectives of the NM LPC/SDL Conservation Strategy	Established May 2005
9	Funding	EQIP funding available for improvements on federal lands in New Mexico	Beginning 2005
		Implementation Team exploring options for increased state and federal funding for conservation efforts	Beginning 2005 and ongoing

Progress report on SDL conservation activities, 2003 - 2005

Strategy Item	Strategy Description	Action Item/Parties Involved	Status of Action
1.	Discontinue Tebuthiuron spraying w/in 500m of occupied/suitable habitat	Tebuthiuron treatments around occupied/suitable SDL habitat are not being conducted on BLM administered lands	Ongoing
2.	Maintain dispersal corridors of 500m wide		

Strategy Item	Strategy Description	Action Item/Parties Involved	Status of Action
3.	Place well pads >100m from dunes	BLM is working will industry to locate wells outside of dune complexes	Ongoing
4.	Manage well density to <13/mi^2		
5.	Minimize well pad size and carry out site reclamation	BLM program to reclaim Pre-NEPA roads, well pads, rights-of-way, etc. FY04 accomplishments include reclamation of approximately 15 well pads and 3 miles of road. BLM and industry working to implement improved reclamation procedures on current wells, roads, and rights-of-way	Initiated FY04 and ongoing FY05 Ongoing
6.	Limit ORV use in occupied habitat	Unless otherwise designated, ORV use limited to designated roads or trails in the BLM Roswell Field Office	Ongoing
		Road designations in BLM Roswell and Carlsbad Field Offices are being evaluated in the Resource Management Plan Amendment	Initiated FY2005
7.	Minimize impacts of seismic exploration by thumper trucks	BLM cooperating with seismic companies to develop and implement guidelines to avoid dunal complexes that are suitable and/or occupied SDL habitat	Ongoing

Strategy Item	Strategy Description	Action Item/Parties Involved	Status of Action
8.	Develop public awareness program	Presentations to over 100 students about prairie grassland conservation issues, including SDL and LPC, at the Living Desert State Park	FY2005
		Ongoing communication between agency and oil and gas representatives about need and opportunities for LPC and SDL conservation	Ongoing
		Agency discussions with the Eddy County Board on LPC and SDL issues and conservation strategies	FY2005
		Agency discussions with regional electric cooperatives on SDL and LPC issues	FY2005
9.	Limit pollution by inspecting pipeline/maintaining wells	Well inspections on BLM-administered leases	Ongoing
10.	Research	NMDGF and Texas A&M SDL breeding and dispersal studies	Ongoing
		Landscape analysis and habitat suitability studies by NMDGF, BLM, and Texas A&M	Ongoing
11.	Land Use Planning	BLM Resource Management Plan Amendment addressing special status species with focus on Sand Dune Lizard and Lesser Prairie-Chicken	Under development 2005
		Planning under way to establish New Mexico Prairie Conservation Initiative, housed at the Center for Excellence in Carlsbad, NM	Launched in 2004 and ongoing
		Implementation Team established to advance goals and objectives of the NM LPC/SDL Conservation Strategy	Established May 2005

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Appendix B: Description of suitable habitat for the sand dune lizard

The following description of suitable habitat was developed by a technical subgroup in order to clarify recommendations affecting sand dune lizard suitable habitats.

Suitable habitat is any mosaic of shinnery oak dunal habitat types within 20 km of an occupied site measured from the outer edge of that contiguous habitat site.

The habitat type of primary importance consists of shinnery dune complexes that contain blowouts. Open sand dunes and shinnery oak flats provide habitat to a lesser extent for sand dune lizards.

Brief descriptions of these habitat types include the following (taken from Fitzgerald et al. 1997).

- Shinnery dunes are active sand dune complexes dominated by shinnery oak and characterized by the presence of open blowouts of varying sizes. The blowouts have grasses and other plants growing in them at varying densities.
- Open sand dunes are large active dunes with steep slopes that contain open expanses of bare sand with limited vegetation.
- Shinnery flats are sites with sandy soils dominated by shinnery oak, but have relatively little topographic relief. Several species of grasses and forbs are generally associated with these sites.

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Fitzgerald, L.A., C.W. Painter, D.S. Sais, and H.L. Snell. 1997. The range, distribution and habitat of *Sceloporus arenicolus* in New Mexico. Final Report to New Mexico Department of Game and Fish. Contract #80-516.6-01. 31 pp.

Appendix C: Working Group Members and Committees

Working Group Representatives and Participants

O = Organizing Committee
T = Technical Committee
D = Document Committee

(The following individuals participated significantly in Working Group negotiations, though not all were present for the entire process. Additional individuals who only attended one or two meetings are not listed.)

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Appendix D: Maps

(See fold-outs attached)

Map 1. Planning Area for the Lesser Prairie-Chicken – Sand Dune Lizard Conservation Strategy

Map 2. Lesser Prairie-Chicken and Sand Dune Lizard Distribution

Map 3. Lesser Prairie-Chicken Management Regions

Map 4. Habitat Categories within the Primary Population Area

Map 1
Planning Area
for the
Lesser Prairie-Chicken - Sand Dune Lizard
Conservation Strategy

Colorado

Kansas

Oklahoma

Texas

New Mexico

SAN JUAN
RIO ARRIBA
TAOS
COLFAX
UNION
MORA
LOS ALAMOS
HARDING
MCKINLEY
SANDOVAL
SANTA FE
SAN MIGUEL
BERNALILLO
QUAY
CIBOLA
GUADALUPE
VALENCIA
TORRANCE
CURRY
DE BACA
CATRON
SOCORRO
ROOSEVELT
LINCOLN
CHAVES
SIERRA
GRANT
LEA
OTERO
EDDY
DONA ANA
LUNA
HIDALGO



Conservation Strategy Planning Area
Lesser Prairie-Chicken Historic Range
Known Distribution of Sand Dune Lizard in New Mexico
County Boundary
State Border
Shinnery Oak - Sand Sage Grasslands

0 20 40 60 80 100 Miles

Map produced on July 20, 2005

No warranty is made by the LPC_SDL Conservation Strategy Working Group as to the accuracy, reliability, or completeness of these data for individual use or aggregate use with other data, or for purposes not intended by theWorking Group . Spatial information may not meet National Map Accuracy Standards. This information may be updated without notification.

Map 2
Lesser Prairie-Chicken and Sand Dune Lizard Distribution within the Planning Area

QUAY
GUADALUPE
CURRY
DE BACA
ROOSEVELT
CHAVES
LEA
EDDY

Ragland
Grady
Broadview
McAlister
Field
Fort Sumner
Lande
Yeso
Buchanan
Evanola
Ricardo
Melrose
Grier
Clovis
Floyd
Portales
Delphos
Mesa
Elida
Dora
Kenna
Milnesand
Roswell
Hagerman
Lake Arthur
Artesia
Hope
Atoka
Loco Hills
Buckeye
Tatum
Lovington
Hobbs
Monument
Oil Center
Eunice
Jal
Lakewood
Carlsbad
Loving
Malaga
Whites City

NEW MEXICO
TEXAS

- Bureau of Land Management
- Bureau of Reclamation
- Dept. of Energy
- Forest Service
- Fish & Wildlife Service
- Private
- State
- State Game & Fish
- State Park

- County Boundary
- State Boundary
- Federal / State Highway
- River/Stream
- Waterbody
- Urban Area
- Town/Village

- Conservation Strategy Planning Area
- Sand Dune Lizard Known Distribution
- State Lesser Prairie-Chicken Area (PCA)
- Shinnery Oak - Sand Sage Grasslands
- Lesser Prairie-Chicken Distribution **

** Specific LPC distribution in northern Roosevelt and Curry counties is not shown.

LPC distribution south of Chaves County primarily represents scattered small groups.

0 10 20 30 40 50 Miles

New Mexico



Map produced on July 25, 2005

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Map 3
Lesser Prairie-Chicken Management Regions

QUAY
GUADALUPE
CURRY
DE BACA
ROOSEVELT
CHAVES
LEA
EDDY

Pastura
Ragland
Jordan
Grady
Broadview
McAlister
Field
Fort Sumner
La Lande
Yeso
Buchanan
Evanola
Ricardo
Melrose
Grier
Clovis
Floyd
Portales
Delphos
Mesa
Elida
Dora
Kenna
Core Mgmt Area proposed to become PPA
Milnesand
Roswell
Caprock
Tatum
Hagerman
Lake Arthur
Lovington
Artesia
Maljamar
Hope
Loco Hills
Atoka
Buckeye
Hobbs
Lakewood
Monument
Oil Center
Eunice
Carlsbad
Loving
Malaga
White City
Jal

NEW MEXICO
TEXAS

- Bureau of Land Management
- Bureau of Reclamation
- Dept. of Energy
- Forest Service
- Fish & Wildlife Service
- Private
- State
- State Game & Fish
- State Park

- County Boundary
- State Boundary
- Federal / State Highway
- River/Stream
- Waterbody
- Urban Area
- Town/Village

- SSPA
- PPA
- IPA
- State PCA
- Roswell Core Management Area

0 10 20 30 40 50 Miles

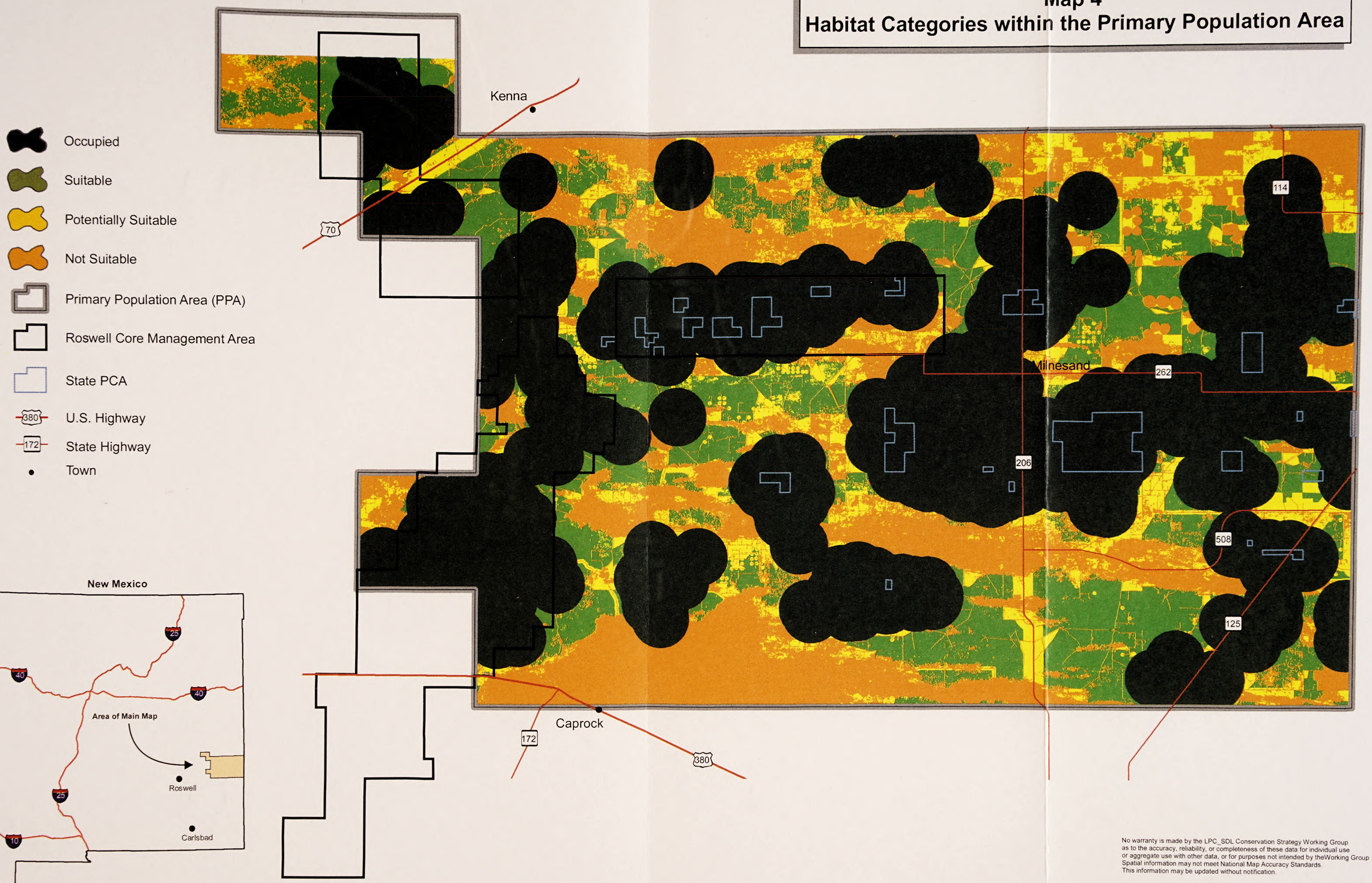
New Mexico

Area of Main Map

Map produced on July 20, 2005

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Map 4
Habitat Categories within the Primary Population Area



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Map produced on September 1, 2005

Appendix 3



APPENDIX 3
LESSER PRAIRIE-CHICKEN
AREA OF CRITICAL ENVIRONMENTAL CONCERN
NOMINATION

Lesser Prairie-Chicken (*Tympanuchus pallidicinctus*) Area of Critical Environmental Concern (ACEC)

A petition to the New Mexico BLM



Petitioners

Forest Guardians
Dr. Jim Bailey
Audubon New Mexico
New Mexico Audubon Council
Animal Protection of New Mexico
Chihuahuan Desert Conservation Alliance
REP Environmental Education Foundation
New Mexico Chapter of Republicans for Environmental Protections
Southwest Environmental Center
Defenders of Wildlife
T & E, Inc.

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Special thanks to T & E, Inc., without whom
this petition would not have been possible.

LESSER PRAIRIE-CHICKEN AREA OF CRITICAL ENVIRONMENTAL CONCERN
Justification for Nomination

Nomination

Pursuant to the Federal Land and Policy Management Act (FLPMA) of 1972, 43 U.S.C. '1701, *et seq*., petitioners hereby petitions the Bureau of Land Management (BLM) to designate the below described BLM administered public lands as an Area of Critical Environmental Concern (ACEC) for the critically imperiled Lesser Prairie-Chicken (*Tympanuchus pallidicinctus*). Petitioners respectfully submit this nomination as an interested party, pursuant to BLM Manual '1617.81B (2000) and section 553(e) and 555(e) of the Administrative Procedures Act, 5 U.S.C. §§ 553(e) et seq., which grants members of the public the right to nominate areas of BLM-administered lands for ACEC designation. The petitioners have identified this area, which we refer to as the proposed Lesser Prairie-Chicken ACEC, as a potential ACEC based on the relevance and importance criteria as outlined in BLM manual 1613. As will be shown, the critically imperiled status of this species requires that the BLM authorize an amendment to the current programmatic land use plan to allow for the designation of the proposed Lesser Prairie-Chicken ACEC.

Introduction

The Federal Land Policy and Management Act (FLPMA) mandates that the BLM manage public lands in a manner that protects environmental quality, including important wildlife habitat, water resources and other ecological values (43 U.S.C. '1701). FLPMA also mandates that, in developing and revising land use plans, the BLM must give priority to the designation and protection of ACECs (43 U.S.C. '1701). In the New Mexico BLM Standards for Livestock Grazing, finalized in January of 2000, the Lesser Prairie-Chicken was given priority as a special status species. In addition, in response to a 1995 petition to list the Lesser Prairie-Chicken under the Endangered Species Act (ESA) the U.S. Fish and Wildlife Service (USFWS) found that the species was warranted for listing as a threatened species under the ESA, but that the species listing was precluded by the need to list other higher-priority species. The "warranted, but precluded" finding established the Lesser Prairie-Chicken as a "candidate species" under the ESA. The USFWS has continued to find the Lesser Prairie-Chicken's listing to be warranted but precluded in every year since the 1998 petition finding. Additionally, in 1999 the director of the New Mexico Department of Game and Fish (NMDGF) made a recommendation to the New Mexico State Game Commission (NMSGC) to list the Lesser Prairie-Chicken as "threatened" under the New Mexico Wildlife Conservation Act. The director's recommendation was never acted upon. Finally, the U.S. Forest Service in Region II lists the Lesser Prairie-Chicken as "sensitive", and the species is listed as "threatened" by the Colorado Division of Wildlife. Therefore, designation of the proposed Lesser Prairie-Chicken ACEC would be a significant partial requirement toward fulfilling the BLM's mandate under FLPMA, as well as under the BLM's policy requirements (BLM Manual '6840.06) to conserve special status species.

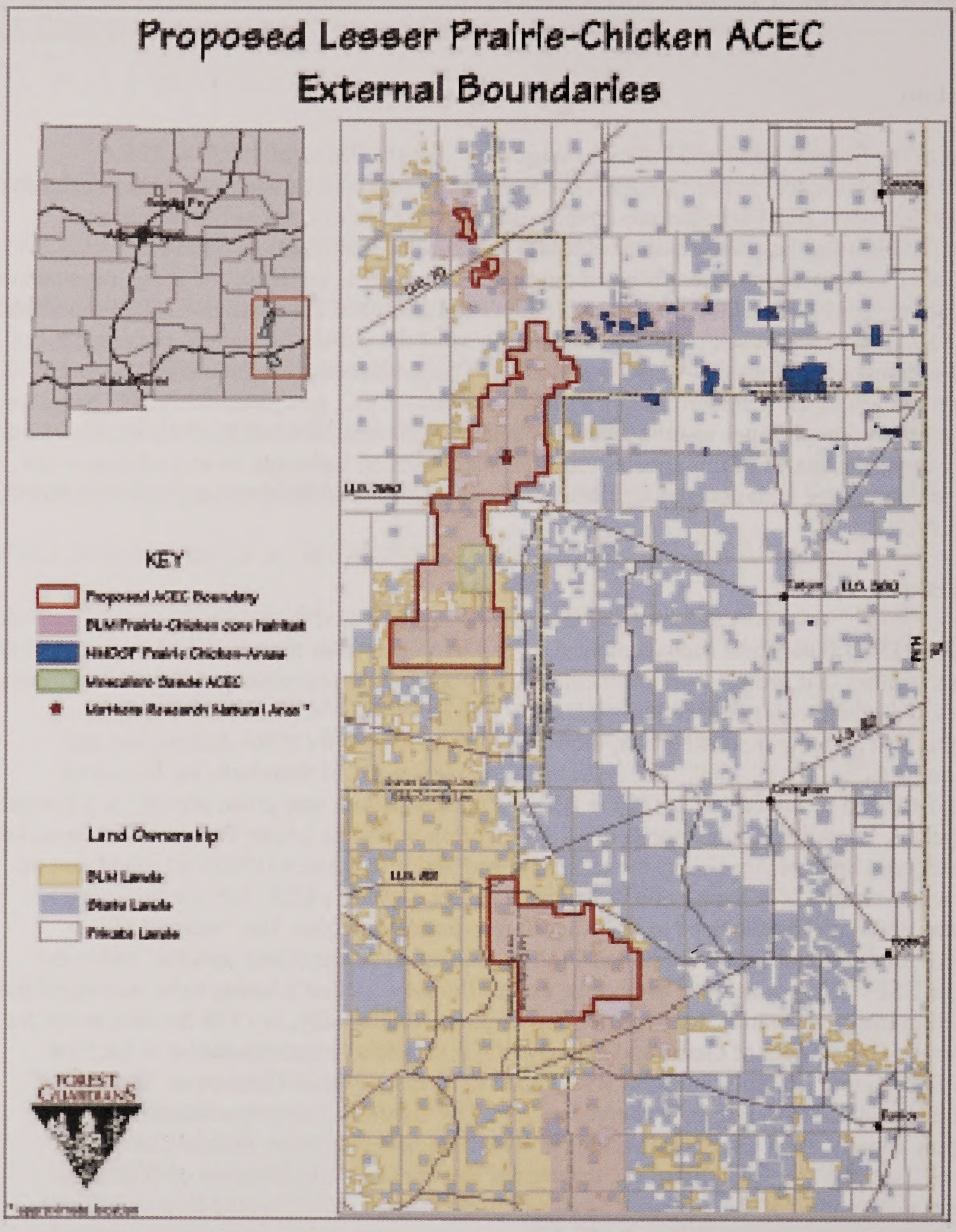


Figure 1. Exterior Boundaries of the proposed Lesser Prairie-Chicken ACEC. The proposed Lesser Prairie-Chicken ACEC includes 935 km2 of BLM lands within the indicated boundaries. The proposed ACEC correspond to BLM designated core habitat for the Prairie-Chicken, vegetation and habitat community types and known Prairie-Chicken populations.

Location and Site Description

The proposed Lesser Prairie-Chicken ACEC is located in a series of adjacent parcels north and south of highway U.S. 82. The southern parcel is in an area administered by the BLM's Carlsbad Field Office and begins just below the 4th Standard Parallel (approximately 33^0 24' N), straddling the Eddy and Lea county lines. This area encompasses approximately 388.5 km^2, 87% of which is BLM Land, with an additional 48.6 km^2 of State and private land. The northern parcels are administered by the BLM's Roswell Field Office, extend northward to the 1st Standard Parallel (approximately 33^0 48' N), and are contained entirely within Chaves County. The northern parcels consist of one large area bisected by U.S. 380 and two small areas to the north adjacent to U.S. 70. These areas together encompass approximately 740.6 km^2, 74% of which is BLM land, with another 194.2 km^2 of State and private land. The proposed ACEC would consist only of the BLM Land within the boundaries (Figure 1).

The boundaries of the proposed ACEC are delineated by BLM designated "Core Habitat Areas" for the Lesser Prairie-Chicken, known lek sites and vegetation and habitat composition. The sites are composed of a diversity of habitats required to support stable populations of Lesser Prairie-Chickens, including lekking grounds, nesting habitat, brood rearing habitat and wintering habitat. The principal community type occurring within the boundaries of the proposed ACEC is the shinnery-oak-grassland type, recognized by the U.S. Forest Service as "a rich wildlife habitat" compared to the surrounding vegetation communities, that is in need of study and protection due to the clearing of oak as a land management practice (Peterson and Boyd 1998). The northern parcels of the proposed Lesser Prairie-Chicken ACEC contain the relatively small Mescalero Sands ACEC, a 32 km^2 area characterized by the BLM as a "drifting sands, endemic plant and wildlife community" that itself contains 7.3 km^2 of State Lands and 1.3 km^2 of private land suitable for acquisition (BLM 1997: 2-80). The northern parcels also include the 1.0 km^2 Mathers Research Natural Area (RNA), an area managed so that only "natural ecological changes and limited management activities are allowed", Visual Resource Management (VRM) class I (BLM 1997: 2-66).

The northern parcels of the proposed Lesser Prairie-Chicken ACEC contain some of the highest densities of known active lek sites within New Mexico (Morrissey 1995, BLM 1997, Peterson and Boyd 1998). The northern parcels of the proposed Lesser Prairie-Chicken ACEC are within the core of the remaining Prairie-Chicken habitat in New Mexico (Bailey and Williams 2000, Bailey 2002). The southern parcel of the proposed ACEC contains the remaining majority of the species habitat on public land, as well as a large portion of historical lek sites on public lands in New Mexico (Morrissey 1995, BLM 1997, Peterson and Boyd 1998, Bailey 1999 and 2000). Extirpation within the southern portion of the Lesser Prairie-Chicken range, including the southern parcel of the proposed ACEC, is imminent (Johnson et al. 1999). Given these urgent circumstances, the BLM has an opportunity and a duty under FLPMA to conserve and restore the Lesser Prairie-Chicken within both of these parcels by immediate designation and protection of this habitat as an ACEC.

Land Ownership Percentages within exterior boundaries of Proposed Lesser Prairie-Chicken ACEC

Northern Parcels

Southern Parcel

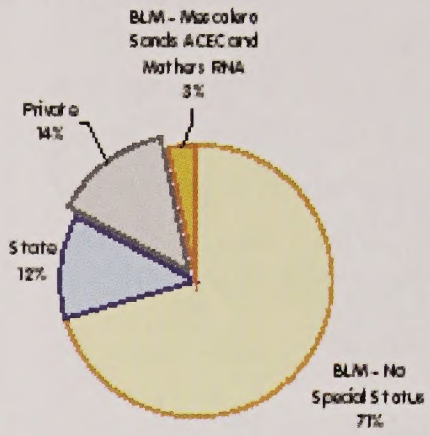


Figure 2. Land ownership of the proposed Lesser Prairie-Chicken ACEC. The majority of BLM Lands within the core of Lesser Prairie-Chicken habitat currently have no special protections. Within the proposed ACEC's northern parcels only 3% of BLM lands have any special status, and management prescriptions remain contrary to the requirements of Prairie-Chickens. Within the proposed ACEC's southern parcel, no special status lands have been designated. While there are private and state lands within the exterior boundary of the ACEC, only BLM land would be included in the ACEC designation.

Petitioners

Primary petitioner Forest Guardians is a non-profit conservation organization located in the southwestern United States. Forest Guardians seeks to preserve and restore native wildlands and wildlife in the American Southwest through fundamental reform of public policies and practices. The organization has approximately 2,000 members, most of who reside in New Mexico and Arizona.

Members engage in wildlife viewing, outdoor recreation, and other activities throughout the Southwest and are particularly concerned with the management of public lands that are essential to the recovery of the Lesser Prairie-Chicken. The health and integrity of ecosystems throughout Western public lands is an important to these members' aesthetic, scientific, and recreational enjoyment of public lands. Forest Guardians and its members are particularly concerned with the conservation of the Lesser Prairie-Chicken and the native ecosystems that it depends upon for survival.

Petition author Jon-Paul Oliva is a conservation biologist and graduate (M.S. Evolution & Ecology, 2001) of the University of New Mexico, Albuquerque and has expertise in plant and community ecology. Jon-Paul has over four years of professional experience in researching and studying a variety of threatened, endangered and sensitive plant and animal species. Jon-Paul is also a Geographic Information Systems (GIS) analyst and uses this tool to model habitat and understand landscape level phenomena affecting endangered, threatened and sensitive species.

Jim Bailey, Ph.D. – Jim Bailey is a private citizen and expert biologist on Lesser Prairie-

Chickens with an interest in promoting the conservation and recovery of New Mexico's populations of Lesser Prairie-Chickens.

New Mexico Audubon Council - The New Mexico Audubon Council is an independent non-profit organization representing five local Chapters of the National Audubon Society in New Mexico whose mission is to conserve and restore natural ecosystems, focusing on birds, other wildlife, and their habitats. The New Mexico Audubon Council represents more than 4,000 members in New Mexico. In 1997, the New Mexico Audubon Council led the effort to petition the New Mexico State Department of Game and Fish to study the status of the Lesser Prairie-chicken for possible listing under the New Mexico Wildlife conservation Act. That study resulted in a recommendation that the State Game Commission list the Lesser Prairie-chicken as threatened in New Mexico.

Audubon New Mexico- Audubon New Mexico currently represents 4500 members and 4 local chapters in New Mexico. The mission of Audubon New Mexico is to promote the conservation and restoration of ecosystems, focusing on birds and other wildlife through advocacy, education, stewardship and Chapter support, for the benefit of New Mexico citizens of today and tomorrow. Audubon New Mexico is organized to be a State Field Office of the National Audubon Society in New Mexico. Audubon New Mexico is an organization of members that use education and advocacy to further our interest in providing wildlife conservation in New Mexico. For over 18 years we have worked with Federal, State and Local resource agencies and councils to further our interest in providing protection and conservation of New Mexico's rich wildlife heritage.

Animal Protection of New Mexico - Animal Protection of New Mexico, Inc. (APNM) is a statewide nonprofit organization that advocates the rights of animals by affecting systemic change that results in their humane treatment.

Chihuahuan Desert Conservation Alliance – The Chihuahuan Desert Conservation Alliance (CDCA) was originally started in 1986 as the Carlsbad Concerned Citizens for Responsible Land Management and the name was changed to CDCA in 1995. CDCA is involved in a wide variety of activities including outdoor and public education, treeplanting and soil conservation projects, construction of nesting platforms for herons, monitoring of wild populations of birds and other animals, bird-banding activities, and other conservation activities. CDCA also takes a stand and gets involved on a wide variety of environmental and environmental justice issues.

New Mexico Chapter of Republicans for Environmental Protection (NM-REPAmerica) – NM-REPAmerica consists of New Mexicans from across the state who are committed to restoring the Republican Party to its proud heritage of conservation and care for the environment.

Republicans for Environmental Protections Environmental Education Foundation – The REP Foundation is a tax-exempt charitable institution dedicated to educating and building a conservative constituency for environmental protection.

Southwest Environmental Center - The Southwest Environmental Center is a non-profit organization dedicated to protecting the environment in southern New Mexico and neighboring areas through grassroots education and activism. SWEC's mission is to foster understanding and

concern for the Southwest's natural heritage, and promote action for its protection and restoration.

Defenders of Wildlife - Defenders of Wildlife is dedicated to the protection of all native wild animals and plants in their natural communities. Defenders programs' focus on what scientists consider two of the most serious environmental threats to the planet: the accelerating rate of extinction of species and the associated loss of biological diversity, and habitat alteration and destruction.

T & E, Inc. – T & E, Inc. is a not for profit, private foundation dedicated to the appreciation and preservation of our native flora and fauna. T & E, Inc. has funded in the past and continues to fund research projects devoted to the Lesser Prairie-Chicken and believes there are many other valuable resources that will also benefit from ACEC designation.

Biology of the Lesser Prairie-Chicken

Habitat and Habitat Use

Current habitat of Lesser Prairie-Chickens in New Mexico is almost entirely contained within the shinnery-oak-grassland community type. This community type is characterized by the shinnery-oak (*Quercus havardii*), which can co-dominate with sand sagebrush (*Artemisia filifolia*) and is mixed with mid and tall grasses that are usually taller than the shinnery-oak itself (Peterson and Boyd 1998). Within the community type the major sub-types in New Mexico consist of; 1) shinnery-oak with sand bluestem and little bluestem, 2) Shinnery-oak lacking bluestem but rich in gramas, dropseed and threeawn grasses and, 3) sandhills, dominated by shinnery-oak with sparse grass cover (Peterson and Boyd 1998). The shinnery-oak communities of eastern New Mexico are found in sandy soils with low amounts of clay, a high soil permeability and very low rates of water erosion. Shinnery-oak is rarely taller than 2 ft. high, but has a disproportionately large underground stem system that serves a vital function in sand and soil stabilization (Peterson and Boyd 1998). The root system of shinnery-oak are usually horizontal within a few feet of the surface, but roots have been reported up to 30 ft. deep where shifting dunes have repeatedly buried and exposed plants, forcing the formation of new roots and shoots (Peterson and Boyd 1998). Shinnery-oak is also a long-lived species, with individual shoots having lifespans of 5-12 years and clones reaching sizes of up to 7,000 m^2. Shinnery-oak commonly attain ages of hundreds and probably thousands of years (Peterson and Boyd 1998). The longevity of individual clones of shinnery-oak help explain its slow means of reproduction. Plants are almost never known to reproduce by seed, instead relying almost entirely on clonal reproduction. The lateral movement of shinnery-oak into adjacent areas is exceedingly slow, with plants failing to encroach on old fields surrounded by shinnery-oak and left fallow for over 50 years. In the rare cases of shinnery-oak expansion into abandoned fields, the rate of expansion is slow, up to 30 ft. over a period of 50 years (Peterson and Boyd 1998). Although the shinnery-oaks do not reproduce sexually, they do produce large acorn crops. The buds of the shinnery-oak swell in early to late March and the leaves open in April and May. If drought conditions are severe, plants may fail to leaf out in the spring, but may leaf out later in the season if moisture becomes available (Peterson and Boyd 1998). Shinnery oak produce acorn crops approximately every 3 out of 10 years locally, with crops occurring somewhere every year but not more than twice in

five years in a given location (Peterson and Boyd 1998).

Habitat of the Lesser Prairie-Chicken consists of four seasonally used components: lek sites (late February- early May), nesting sites (late April- mid June), brood rearing sites (late May-late July) and wintering sites (Taylor and Guthery 1980b, Davis 1981, Riley et al.1993b, Riley and Davis 1993, USFWS 1998, Giesen 1998, Bailey and Klingel 1998, Applegate and Riley 1998, NRCS 1999).

Lek sites are traditional and are used annually, although sites can be occasionally relocated in response to disturbances such as fire or conversion to agricultural areas (Giesen 1998). Lek sites are used for display purposes and as such are typically found on a locally high area such as a hill or ridge, or a grass flat , Copelin 1963, Taylor and Guthery 1980b, USFWS 1998, Giesen 1998). Lek sites are characterized by a limited amount of low, sparse vegetation, usually grasses (Davis et al. 1981). Probably because of these characteristics, Lesser Prairie-Chicken leks are known to be associated with prairie dog towns, as well as other disturbed areas such as roads or abandoned oil and gas well pads (Davis et al. 1981, Morrissey 1995). Habitat surveys have shown that good Lesser Prairie-Chicken habitat can support approximately 1-2 lek sites per square mile (Morrissey 1995, Bailey 1999).

Males gather on lek sites in early spring, typically in the early morning and at dusk, with display activity peaking in early April (Giesen 1998, USFWS 1998). Males are also known to gather on lek sites during the fall, usually in lower density than during the spring, and breeding has not been reported (Taylor and Guthery 1980b, Giesen 1998). Males utilize vocalizations, called "booming" and posturing to attract females, who may visit lek sites 2-3 days prior to the initiation of mating (Giesen 1998). Food sources during this period of time are primarily plant based and include seeds, leaves, flowers and buds with shinnery-oak leaf galls, catkins leaves and acorns provide 60-70% of the food supply for the birds (Davis et al. 1980, Taylor and Guthery 1980b, Riley et al. 1992, Giesen 1998, Peterson and Boyd 1998, USFWS 1998).

The shinnery-oak-grassland community characterizes nesting habitat within New Mexico, and studies have repeatedly shown that female Lesser Prairie-Chickens prefer nesting habitat where rangeland health is excellent (Copelin 1963, Davis et al. 1979, USFWS 1998, Bailey 1999, Bailey et al. 2000). Successful nests are usually within bluestem clumps, primarily where residual vegetation cover is dense and where bluestem comprises greater than 25% of the vegetative cover (Davis et al. 1981, Giesen 1994). Vegetation height also strongly influences nesting success, with the most successful nests having a range of cover heights of 43-81 cm. with an average of 67 cm. (Riley et al. 1992, Giesen 1994,USFWS 1998). Vegetation density is always greater at nesting sites than in the surrounding rangeland, and is always greater at successful nests than at unsuccessful nests (Riley et al. 1992, Giesen 1994). The basal area of bluestem clumps is also important to nesting success, with successful nests having thicker and wider basal areas than unsuccessful nests (Riley et al. 1992). The regular distribution of suitable bluestem clumps is also important, as isolated patches of suitable nesting habitat provide a reliable target for predators and are correlated with decreasing nest success (USFWS 1998). Additionally, when grass cover is less abundant, Prairie-Chickens may become more dependent on shrub and forb cover for nest sites, resulting in decreased nesting success (Morissey 1995).

Lesser Prairie-Chickens select a nesting site within approximately 1.8 miles of the lek site (Giesen 1994). Because nesting occurs in early spring before the seasonal growth of bluestem, Prairie-Chickens are highly dependent on the persistence of residual grasses from the previous years for nesting cover and protection from predators (Davis et al. 1979 and 1981, Taylor and Guthery 1980b, Riley et al. 1992, USFWS 1998). Once a nesting site is selected, hens lay an average clutch of 10-12 eggs and the incubation period lasts from 24-26 days after the last egg is laid (Giesen 1998). Food sources during nesting are again primarily seeds, leaves, flowers and buds with shinnery-oak leaf galls, catkins, leaves and acorns providing the majority of the bird's food supply (Davis et al. 1980, Taylor and Guthery 1980b, Riley et al. 1992, Giesen 1998, Peterson and Boyd 1998, USFWS 1998).

Brood rearing habitat within New Mexico is also within the shinnery-oak-grassland community (Davis et al. 1979, Taylor and Guthery 1980b, Giesen 1998, Peterson and Boyd 1998). Brood rearing habitat is characterized by a greater cover of shinnery-oak and forbs than the surrounding areas. Areas of bare ground that provide enough space for the chicks to move freely are essential for successful brood rearing. Hens prefer areas of taller shrub cover than do birds without broods, and the density of grasses is lower and the height of grasses shorter than at nesting sites (Davis et al.1979, Riley et al. 1992, Riley and Davis 1993). Active sand dunes with shinnery-oak cover are common in brood habitat (Bailey 2000). Prairie-Chickens are more tolerant of mild to moderate disturbance levels, such as fire and grazing, within brood habitat than within nesting habitat (Davis et al. 1979). Good quality brood habitat also provides an abundant supply of insects, which are the main food source for chicks during the summer season (Davis et al 1980, Taylor and Guthery 1980b, Riley and Davis 1993). The insects consumed by Prairie-Chicken broods are primarily grasshoppers (Acrididae and Tettigoniidae) and treehoppers (Membracidae) which comprise up 60-90% and 30% of the diet, respectively (Davis et al 1980, Riley and Davis 1993). For adults, insect utilization can approach 55% (Davis et al. 1980). The reliance on green vegetation as a food source decreases during this period to approximately 23%, but the relative proportion of shinnery-oak acorns increases to approximately 21% (Davis et al. 1980).

Autumn and winter habitat within New Mexico is also within the shinnery-oak grassland community, with agricultural fields supplementing the habitat (Giesen 1998, Bailey 1999). Beginning in the autumn, birds of different broods assemble into flocks where they roost in the shinnery-oak-grassland communities (Taylor and Guthery 1980a). Bailey (1999) speculated that although Prairie-Chickens are known to utilize waste grain fields as a supplemental food source, fields far from shinnery-oak cover might attract predators and enhance predation during the autumn-winter season. Reliance on shinnery-oak as a food source is high during this period, with leaves, catkins acorns and insect galls providing the primary constituents of the diet. In the autumn, use of shinnery-oak constitutes between 36-50% of the Prairie-Chicken diet, primarily acorns and insect galls (Crawford and Bolen 1976, Riley et al. 1993). The primary animal component of the Lesser Prairie-Chicken's autumn diet consists of short-horned grasshoppers (Acrididae), which makes up approximately 15% of the food source (Riley et al. 1993). Importantly, Crawford and Bolen's study found that even though waste grain fields were present, autumn food utilization was still primarily shinnery-oak acorns and insect galls, suggesting that Prairie-Chicken utilization of waste grains is minimal, except in the absence of suitable shinnery-oak grassland communities (Crawford and Bolen 1976).

The winter diet of the Lesser Prairie-Chicken is characterized by a decreased utilization of insect food sources and an increased reliance on vegetative food stuffs. Use of shinnery-oak acorns increases dramatically, with one study reporting that acorns comprised 69% of the winter diet (Davis et al. 1979, Riley et al. 1993). Prairie-Chickens also rely on wild buckwheat (*Eriogonum annuum*) as a food source during the winter season, with Riley et al. (1993b) reporting that the grain comprised 15% of the bird's winter diet.

The Lesser Prairie-Chicken relies on a mosaic of varied landscape and community subtypes within the shinnery-oak grassland community as habitat throughout the year (Riley et al. 1993, Bailey 1999). The bird's close association with the shinnery-oak-grassland community type in New Mexico is because this vegetation is critical for both food and cover. The lekking behavior of the Prairie-Chicken is dependent upon the exposed knolls and ridges that characterize lek sites. Nesting and brood rearing phases of Lesser Prairie Chicken reproduction are particularly sensitive to plant community composition, with nesting success being highly correlated with the density and height of bluestem (*Andropogon* spp.) for nest concealment, and brood rearing success with the health of shinnery-oak dominated areas for concealment and as a source of insect food stuffs. It should be noted that Prairie-Chickens are not dependent on free water during any phase of the life cycle, but instead appear to meet their moisture requirements from insects, vegetation and dew formation (Morrissey 1995, Giesen 1998).

Geographic Distribution and Abundance

Historical

Historical reports suggest that Lesser Prairie-Chickens were locally abundant throughout eastern New-Mexico, the Texas panhandle, western Oklahoma, southwestern Kansas and southeastern Colorado, with small populations possibly existing in northeastern Colorado and extreme northwestern Nebraska (Colvin 1914, Ligon 1927, Bailey 1928, Taylor and Guthery 1980b, USFWS 1998). The approximate total area of this historic distribution was reported to be 358,000 km^2 (Taylor and Guthery 1980b, USFWS 1998).

The historic distribution of the Lesser Prairie-Chicken in eastern New Mexico was widespread and included all or parts of Union, Colfax, Harding, Quay, Guadalupe, De Baca, Curry, Roosevelt, Lea, Chaves and Eddy Counties (Ligon 1927, Bailey 1928). Ligon (1961) reported an 'ancestral' distribution lying east of the Pecos River Valley in a north-south band approximately 75 miles wide. The approximate total area of this historic distribution was reported to be 9864 mi^2 (Bailey and Williams 2000).

The pre-twentieth century abundance of Lesser Prairie-Chickens within their historical range is not precisely known. Estimates varied widely, with one estimate of over two million birds in Texas alone (Litton 1978, U.S.F.W.S. 1995). Bailey and Williams (2000) estimate, perhaps more reliably, that during an undefined period when the maximum historic range was occupied, the total population was roughly 125,000 birds.

While these numbers range widely, the general consensus in the literature is that pre-twentieth century abundance was relatively high but declined considerably after 1920 (Taylor and Guthery

1980b, Applegate and Riley 1998, Giesen 1998, Peterson and Boyd 1998, USFWS 1998, Bailey 1999, Bailey and Williams 1999, NRCS 1999,Giesen 2000, Sullivan et al. 2000, among others). Within New Mexico, population estimates for the years 1949 and 1961 were approximately 40-50,000 birds, and had declined to 8,000-10,000 birds by 1968 (Sands 1968, USFWS 1998). Crawford (1980) estimated the New Mexico population of Lesser Prairie-Chickens in 1979 to be approximately 10,000 birds.

Current

The distribution of Lesser Prairie-Chickens has been greatly reduced since about 1920, and recent estimates suggest that the species occupies only 8-10% (28,640-35,800 km^2) of its historic range (Taylor and Guthery 1980b, USFWS 1998, Bailey and Williams 1999, Bailey 2002). Lesser Prairie-Chickens exist today in southeastern Colorado, southcentral Kansas, western Oklahoma, southeastern New Mexico and the Texas panhandle (USFWS 1998). In Colorado, Lesser Prairie-Chickens have been extirpated from three of the six counties that they are once thought to have inhabited, and today are found only in Baca, Prowers and Kiowa Counties. In Kansas, Lesser Prairie-Chickens once occupied 38 counties and today occupy 34. In Oklahoma, Lesser Prairie-Chickens once occupied an estimated range of 10,143 km^2 and today occupy approximately 1,162 km^2, corresponding to an 89% decrease from historic range size. In Texas, Lesser Prairie-Chickens once occupied an estimated 13,663 km^2 and today occupy approximately 5,732 km^2, corresponding to a 58% decrease from historic range size (USFWS 1998).

Within New Mexico, Lesser Prairie-Chickens once occupied an estimated 38,085 km^2 and today occupy approximately 16,757 km^2, corresponding to a 56% decrease from its historic range size (Bailey and Williams 2000). The species is widely considered to be extirpated from the northeastern portion of its historic range, including all of Union, Harding and Quay Counties (USFWS 1998, Bailey and Williams 2000, Bailey 2002). The last confirmed sightings in these areas were from a NMDGF employee in 1993, and a 1998 NMDGF and U.S. Forest Service (USFS) survey of 190 miles of public road in Union County detected no active Prairie-Chicken leks (Bailey 2000). The most recent survey in this area was conducted by the USFS in 2002, with negative results (J. Bailey, personal communication).

The central portion of the Lesser Prairie-Chicken's historic range is home to the remaining "core" populations of Prairie-Chickens in the state (Figure 3). The first comprehensive survey of these areas was conducted in 1998 and 1999 by NMDGF biologists over 17,716 km^2, with 5,618 km^2 of historic range excluded because of either unsuitable habitat, a lack of basic habitat characteristics or a lack of access (Bailey and Williams 2000). The survey results showed that Prairie-Chicken leks were not detected on 14 of 28 route-transects, in either year (Bailey and Williams 2002). Thirteen of these routes were above 34^0 N, suggesting these populations in DeBaca and Guadalupe counties are probably nearing extirpation (Bailey and Williams 2000). In contrast, survey data collected by NMDGF north of Highway 380 but south of 34^0 N have yielded stable numbers in recent years, with 9 out of 11 routes surveyed having at least one active lek in both 2000 and 2001. This area contains the "core" of present day Lesser Prairie-Chicken populations, and corresponds to just 16% of its historical range (Bailey 2002).

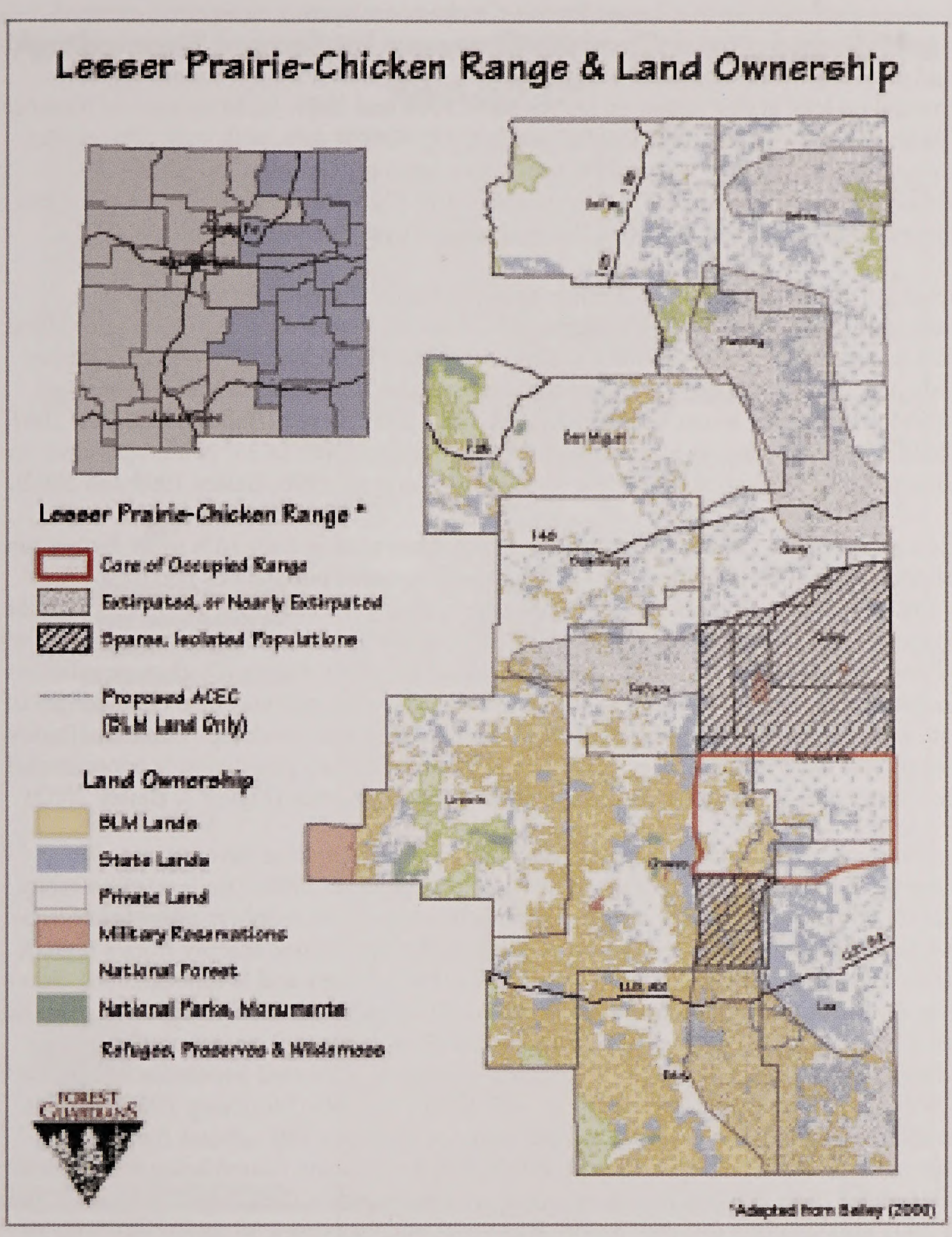


Figure 3. Historic and current range of the Lesser Prairie-Chicken. Once abundant throughout their range in eastern New Mexico, the Lesser Prairie-Chicken is extirpated from 56% of its former range and persists only as sparse and scattered populations in another 28% of that range. The core of the remaining populations is only 16% of its former range (Bailey and Williams 2000, Bailey 2002).

NMDGF survey data indicate that Lesser Prairie-Chickens are nearing extirpation south of Highway 380 in southeast Chaves County. Of the two routes in this area, no leks were detected in 2000 and only one lek on one route was detected in 2001 (Bailey 2002). Similarly, Best (2001) detected no leks in this region on ten routes in 2000 and 2001. BLM surveys of historical lek sites south of Highway 380 have yielded qualitatively similar data, with only 18% of leks surveyed categorized as active, versus 27% active leks north of Highway 380 (Bailey 2002). These data support the conclusion of Bailey and Williams (2000) that Lesser Prairie-Chickens are nearing extirpation south of highway 380 in southeast Chaves County (Bailey 2002).

A significant portion of the unoccupied range lies below 33^0 N latitude, in the extreme southeastern portion of New Mexico including the Querecho Plains. The Carlsbad Field Office of the BLM has approximately 30 historical leks within the Plains. The 1998 NMDGF survey located only one active Prairie-Chicken lek and a subsequent New Mexico Natural Heritage Program (NMNHP) survey found no active leks, as did a 2001 survey (Bailey 1999, Best 2001, Bailey 2002). These populations of the Lesser Prairie-Chicken south of 33^0 N are very close to being extirpated entirely from their historic range (Johnson et al. 1998, Bailey 1999 and 2002).

Today, the Lesser Prairie-Chicken survives in relative abundance in only 16% of its former range in New Mexico (Bailey and Williams 2000). Small and scattered populations persist south of Highway 380 and in parts of DeBaca and Guadalupe counties and comprise another 28% of the species former range (Bailey and Williams 2000). The Lesser Prairie-Chicken is gone from 56% of its historical range in New Mexico (Bailey and Williams 2000). Prairie-Chicken populations of southeastern Chaves County have become sparsely distributed, and may also be in danger of extirpation, as may be the populations above 34^0 N in DeBaca and Guadalupe counties (Bailey 2002). The current distribution of the "core" Lesser Prairie-Chicken population is concentrated in southern Roosevelt, northern Lea and east-central Chaves counties (Figure 3, Bailey 2002).

The New Mexico populations of Lesser Prairie-Chickens are thought to have increased in numbers during the 1980s, before declining to all time lows in the 1990s (Bailey 1998, Bailey and Williams 2000). The NMDGF surveyed hunters to estimate the numbers of birds harvested from 1983-1993 and found that the number of harvested birds declined sharply from a high of 4000 in 1988 to a low of 244 birds in 1993 (Morrissey 1995, Bailey and Williams 2000). Survey results from the BLM Caprock Wildlife Area by both BLM and NMNHP biologists have shown that Prairie-Chicken numbers in this management area have declined from population counts recorded in the 1971-1981 period. Morrissey reported that the estimated population within the Caprock Wildlife Area declined from 2600 in 1983 to 935 by 1995 (Morrissey 1995). Recent data collected within the Caprock Wildlife Area north of Highway 380 indicate that the populations in this area may have stabilized, with active leks/lek site visited being 0.18 in 2000, 0.25 in 2001 and 0.26 in 2002 (J. Bailey, personal communication). Data from the Roswell field office for 2002 also supports this conclusion. BLM personnel surveyed 34 active leks with an estimated 365 birds, with the number of active leks in the period 1999-2002 increasing from 16-34 (Davis 2002). This trend of population stabilization is encouraging, but the numbers are still far below the population levels of the 1970's, a period with comparable moisture.

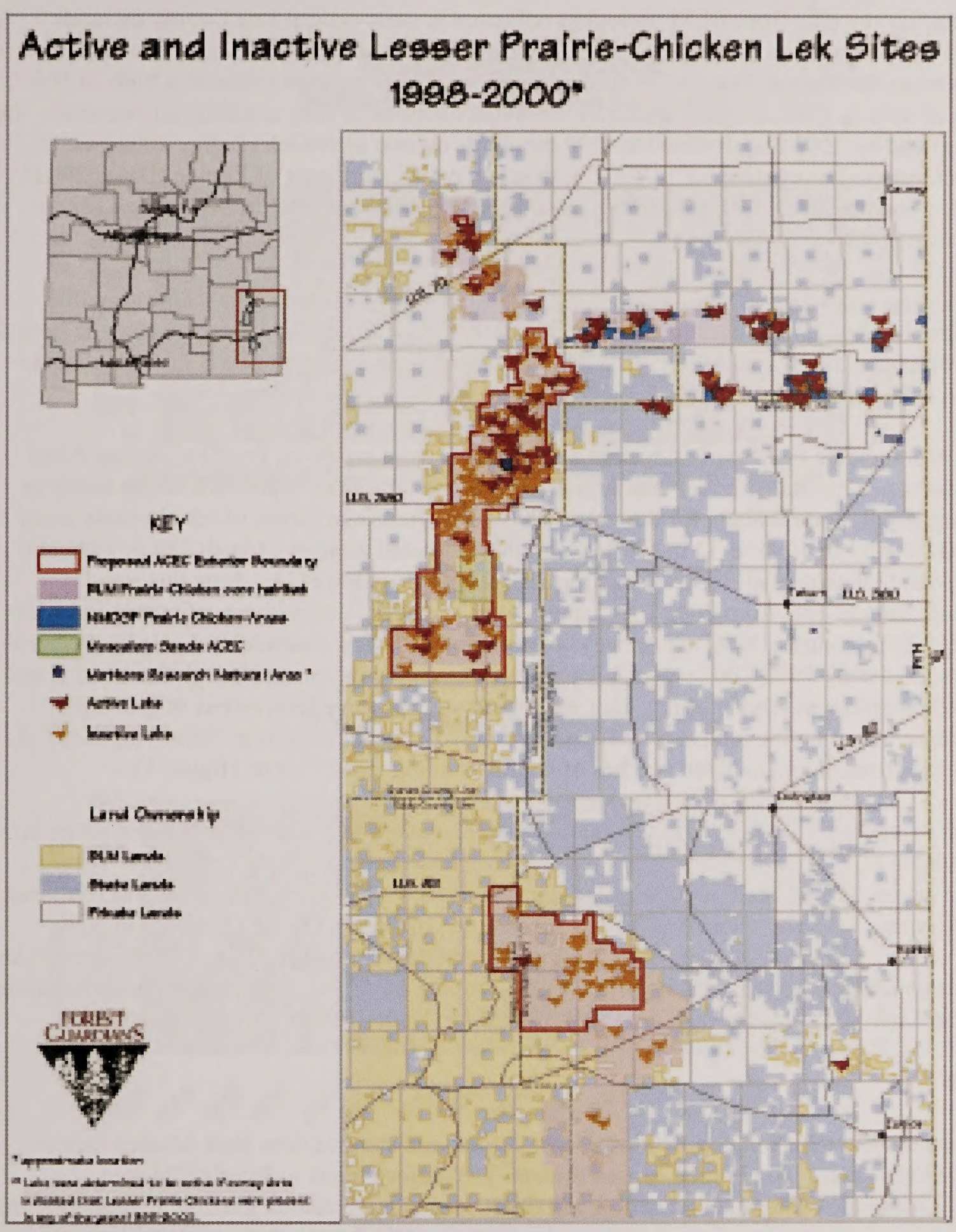


Figure 4. Active and Inactive Lek Sites, 1998-2000. The number of active lek sites in east-central and southeastern New Mexico has declined throughout the 1990s to all-time lows, particularly in the areassouth of U.S. 380.

Additional survey data from BLM biologists collected in west-central Lea County on lands managed by the Carlsbad Field Office (CFO) during the period 1985-1998 have shown even more dramatic declines in Prairie-Chicken populations. These surveys reported a high of 160 birds on 20 leks in 1987, a figure which by 1998 had declined to only six birds on one active lek (Figure 5) and by 2001 had declined to only two birds on one active lek (Bailey 2002). CFO personnel reported one active lek in 2002 with seven males, northeast of Eunice (Davis 2002). The CFO personnel also audibly detected Lesser Prairie-Chickens near an historic lek site in 2002 (Davis 2002).

Data reporting reproductive success supports the conclusions of survey data suggesting that Lesser Prairie-Chicken population trends are declining. Age ratios (juveniles/hen) for the period 1958-1968 averaged 3.7 juveniles/hen, but had declined to an average of 0.65 juveniles/hen in 1989 and 0.59 juveniles/hen in 1995 (Bailey 1999).

Current data indicate that Prairie-Chicken abundance is most stable on Prairie-Chicken Areas (PCAs) managed by the NMDGF. Surveys of 10 of these sites have reported low but stable or increasing population numbers for the years 1996-1998. Active numbers of leks in these areas increased from 11 in 1996 to 32 in 1998, as did the estimated number of birds (29 in 1996 and 181 in 1998) (Johnson et al. 1998). The most recent data from the PCAs show this trend continuing. Survey data from 2002 found a total of 132 active leks, with an estimated 533 birds (Davis 2002). In contrast, NMDGF surveys on randomly located roadside routes in east-central New Mexico during 1998-2002 suggest declining overall populations, although the trend is not statistically significant (Davis 2002). This evidence suggests the effectiveness of grazing exclosures in affecting the recovery of Lesser Prairie-Chicken populations. However, the PCAs in this area are small and isolated patches of habitat totaling just 87.9 km^2 (figure 1).

Based on these data, Lesser Prairie-Chickens have been extirpated from their historic range in northern New Mexico and nearly extirpated from their historic range south of 33^0 N. They persist in sparse and isolated populations in Curry and north Roosevelt County and in southeast Chaves County. Thus the remaining "core" populations of Lesser Prairie-Chickens in New Mexico occupy only 16% of the species historic range, and are found within south Roosevelt and north Lea counties as well as east-central Chaves County, on private lands, BLM lands including part of the Caprock Wildlife Area, and NMDGF PCAs (Bailey 2002).

Threats

The Lesser Prairie-Chicken populations in east-central and southeastern New Mexico face a variety of both natural and human caused threats. The major threats to Prairie-Chicken populations include drought, degradation of habitat caused by livestock grazing, habitat loss and habitat fragmentation, oil and gas development, control of shinnery oak through the use of herbicides, rangeland conversion for other uses, and a lack of adequate protections. The majority of the threats to the Lesser Prairie-Chicken intensify as the local populations become smaller and more isolated. Likewise, the effects of drought are multiplicative when occurring simultaneously with those of livestock grazing and other habitat degradation. The following narrative will outline the major impacts of these threats, as well as their interactive effects, on Lesser Prairie-Chicken populations.

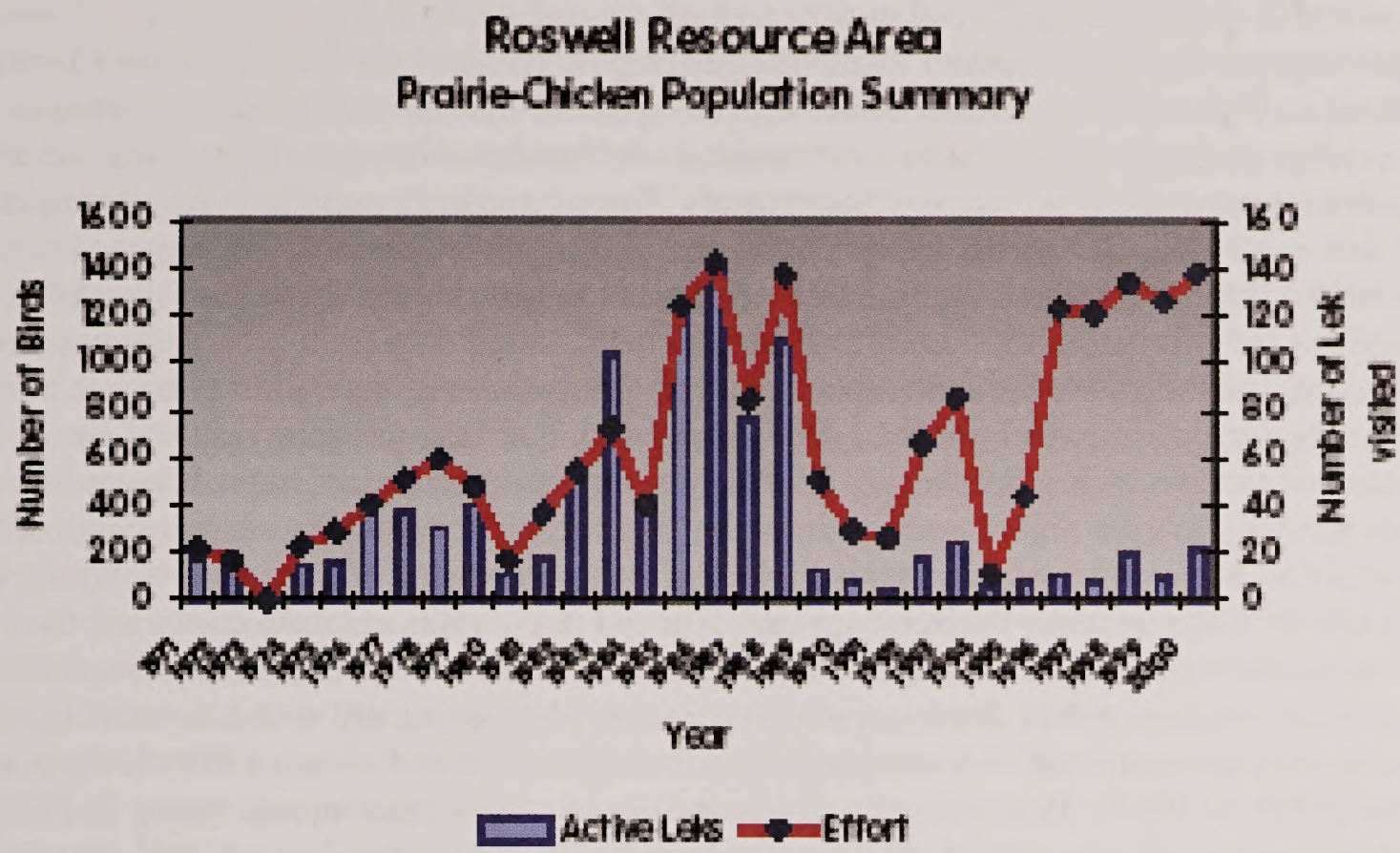


Figure 5. Population trends of BLM Lesser Prairie-Chickens. Populations of Lesser Prairie-Chickens, as estimated by lek surveys, have been steadily declining. Populations of both the Roswell and Carlsbad Resource areas have hit unprecedented lows in the 1990s and early 2000s, despite the fact that survey effort was higher than ever. From Smith et al. 1998.

Drought

Drought is a recurring phenomenon within the geographic range of the Lesser Prairie-Chicken in New Mexico. Even normal precipitation events are sporadic and typically localized. Periods of below average precipitation can have even more severe impacts when interacting with the effects of livestock grazing and other human disturbances. There have been periods of major drought recorded in these areas during the 1930s, 1950s and 1990s (Merchant 1982, Morrissey 1995, Bailey 1999). Bailey (1999) summarized the effects of the most recent drought of the 1990s on the prognosis for survival of the Lesser Prairie-Chickens. Using data from precipitation records, he concluded that the 1990s droughts were not as severe as those of the earlier twentieth century. The dramatic declines seen in Prairie-Chicken population numbers were the result of an interaction of drought with other factors, primarily habitat fragmentation, habitat degradation and livestock grazing. In east-central and southeastern New Mexico, within the current range of the Lesser Prairie-Chicken, forage demand is high, and grazing pressure continues to be high, even during periods of drought. As habitat fragmentation and population isolation increases, the impact of stochastic events like drought on the survival of Lesser Prairie-Chickens becomes more severe (Merchant 1982). Such negative interactive phenomena are well known from population biology studies of wide-ranging organisms (Brussard and Gilpin 1989, Soule et al. 1992, Bolger et al. 1997). Since drought affects the growth of vegetation, and spring and summer droughts can reduce the amount of grass cover, drought has the potential to result in decreased nesting success and increased predation on Lesser Prairie-Chickens. Because Prairie-Chickens depend on residual vegetative cover for nesting habitat, the effects of drought will be most severe in the following year to two years, during the nesting period. In fact, Bailey (1999) reported a weak correlation between precipitation occurring 16-28 months prior to nesting surveys and measured Prairie-Chicken abundance (lek surveys), as did Smith and Johnson (1998). Merchant (1982) also found similar depressive effects of drought on factors affecting Lesser Prairie-Chicken survival, including decreased number of nesting attempts, decreased nesting success, lower brood sizes and greatly reduced spring-summer survival rates of adult female Lesser Prairie-Chickens.

Livestock grazing

When periods of drought coincide with intense livestock grazing, grass cover may be reduced substantially for a period of years, resulting in increased predation and mortality, and decreased nesting success as compared to the effects of drought alone (Merchant 1982). In addition, grazing results in the decrease of Prairie-Chicken food plants and modification of the plant communities away from grasses and towards forbs and shrubs and short grass rangeland pioneering communities (Litton et al. 1994). Lesser Prairie-Chickens have either disappeared or have been reduced severely in numbers where Prairie-Chicken habitat has been excessively grazed (USFWS 1998). Jackson and DeArment (1963) found that the interactive effect of drought and livestock grazing was the single most important factor affecting the recovery of Lesser Prairie-Chicken populations in west Texas following periods of drought. The dependence of Lesser Prairie-Chickens on the narrowly occurring shinnery-oak-grassland community makes the species particularly sensitive to over utilization of the grass component of the community by livestock (USFWS 1998). Effects of grazing intensity on the soil permeability and soil moisture content have been documented (Crawley 1997, Taddese et al. 2002). Soil productivity is

inversely related to grazing pressure in arid ecosystems, with ungrazed areas retaining soil moisture longer, resulting in higher grass production than in heavily grazed areas (Crawley 1997, Brown and Archer 1999). This effect is expected to intensify during periods of drought when grazing pressure remains constant (USFWS 1998). In addition, the over-utilization of grass cover by livestock reduces both grass height and the homogeneity of clump distribution on the landscape, factors which have been repeatedly shown to affect nesting success, presumably through increased predation (Taylor and Guthery 1980b, Riley et al. 1992, USFWS 1998, Bailey 1999). Recent research on grazed pasture areas in Lesser Prairie-Chicken habitat has documented the absence of senescent grasses that provide optimal nest sites (Johnson et al. 1998). The importance of these findings cannot be understated. The reliance of Lesser Prairie-Chickens on residual tall grasses for quality nesting cover means that grasses grown in July through mid-September need to survive ungrazed and untrampled for 9-10 months to provide the necessary quality nesting habitat. Grazing during this period, even relatively light intensity grazing, is likely to adversely affect the Lesser Prairie-Chicken's nesting success and should be avoided wherever Prairie-Chickens are important fauna (J. Bailey, personal communication). The 1997 Roswell Resource Area Proposed Management Plan/Final Environmental Impact Statement, approved in the October 1997 Record of Decision, while expressly authorizing livestock grazing within the Mescalero Sands ACEC, recognizes that "this (livestock grazing) could negatively influence or impair natural ecological processes meant to be protected..." (BLM 1997). In addition, the NRCS continues to subsidize fence and water development costs on private lands in the adjacent areas to promote livestock grazing. This practice results in the degradation of Lesser Prairie-Chicken habitat on private lands, and increases the importance of BLM Land as a habitat refuge for the Lesser Prairie-Chicken (J. Bailey, personal communication).

Habitat Loss and Landscape fragmentation

Several factors have contributed to loss of Prairie-Chicken habitat and habitat fragmentation, including conversion of rangeland to agricultural fields, loss of open rangeland to land development and oil and gas exploration and drilling activities, livestock grazing and tebuthiuron application. The initial conversion of rangeland to crop lands in the later nineteenth and early twentieth centuries did not apparently negatively impact Lesser Prairie-Chicken population numbers, and the widely spaced fields were a small enough component of the habitat that they actually increased food supplies for the species (Crawford 1980, Bailey 1999). After this early period, continuing conversion of rangeland to other uses began to detrimentally affect Prairie-Chicken populations (Copelin 1963, Jackson and DeArment 1963, Crawford 1974, Crawford and Bolen 1976). Today, Prairie-Chickens are entirely gone from areas where more than 37% of the rangeland has been converted to other uses, and have declined from areas where more than 20% of the land has been converted (Copelin 1963, Crawford 1974). While much of the rangeland within the historic range of the Lesser Prairie-Chicken in New Mexico has not been converted to cropland, these figures are important because 59% of the historic Prairie-Chicken range is privately owned and, as such, has little or no federal or state protections (Bailey 1999).

The BLM reported on the amount of habitat disturbed or lost solely to right-of-way activities, primarily roads, within five townships managed by the Carlsbad Field Office. The minimum loss of habitat was 1.2 km^2 over a total of 99.4 km and the maximum was 3.75 km^2 over a total of 322.5 km., with an average of 2.5 km^2 of habitat lost over an average 220.5 km. per township

(BLM 1994: 3-31). It is important to note that this average loss of almost 3% of the remaining habitat includes only 5 of the approximately 30 townships that contain the BLM's "core Prairie-Chicken habitat", and *does not* include habitat loss due to oil and gas well pads, land conversion, use of tebuthiuron or livestock grazing. The report concluded:

"The cumulative loss of habitat within occupied Lesser Prairie-Chicken range is a major limiting factor in the management of the population and to their overall population dynamics…" (BLM 1994: 3-31).

Habitat fragmentation is a result of the same processes that produce habitat loss, but is accompanied by a separate set of effects on native species. Habitat fragmentation leads to the isolation of populations, a factor that limits genetic dispersal and increases the sensitivity of small populations to stochastic events such as drought and fire (Brussard and Gilpin 1989, Soule et al. 1992, Bolger et al. 1997). Small and isolated populations may suffer from inbreeding depression and genetic drift as a result of reduced genetic variability (Westemeier et al. 1998). In a related phenomenon, fragmentation of habitat also creates barriers to population dispersion and colonization, as well as restricting males' abilities to find mates, leading to a loss of reproductive potential (Morrissey 1995). Habitat fragmentation can also lead to the partitioning of habitat patches that are too small to contain an individual's home range (USFWS 1998). Such small patches may not contain the full range of habitat sub-types necessary to support Lesser Prairie-Chicken mating, nesting, brood rearing and over-wintering requirements. Based on Crawford and Bolen (1976) and Copelin (1963), Bailey (1999) reported that a minimum area of 31 km2, with at least 63% rangeland is necessary to support a stable Lesser Prairie-Chicken population. Average individual female non-nesting home range size is 2.31 km2, and the average individual female nesting home range size is 0.92 km2 (Riley et al.1994).

Oil & Gas Development

One widespread land conversion phenomenon that has been taking place on public lands since the second half of the nineteenth century is the conversion of rangeland for oil and gas well pads and associated facilities, roads and pipelines (Figure 5). Bailey reported an average of 16,187 m^2 of land required for an oil or gas well pad, although the number varied widely (1999). The roads created for oil and gas activities are known to attract off road vehicle users, a factor which may lead to further habitat degradation (Bailey 1999). An extensive network of above ground power lines and other support structures has also been erected to provide power to the well pad machinery (Figure 5). The effect of this infrastructure development has been to provide nesting, roosting and foraging sites to ravens (nest predators) and other predatory birds (e.g. Red-tailed Hawk, Great Horned Owl) that would not commonly occur in the shinnery-oak-grassland community (Smith, personal communication). In addition to the effect of oil and gas development on habitat loss and predator populations, there is strong anecdotal evidence that the noise from these activities disrupts Prairie-Chicken lekking behavior, further affecting reproduction success and decreasing usable habitat (Smith et al. 1998). In one study, in the extreme southeastern portion of the historic New Mexico range, only one of 29 historic leks was found to be active, with oil pump noise being moderate to high at 45% of the sites and low at 28% of the sites (Smith et al. 1998). The authors concluded that significant noise pollution from oil and gas well pad operations may be playing a role in extirpating the Lesser Prairie-Chickens

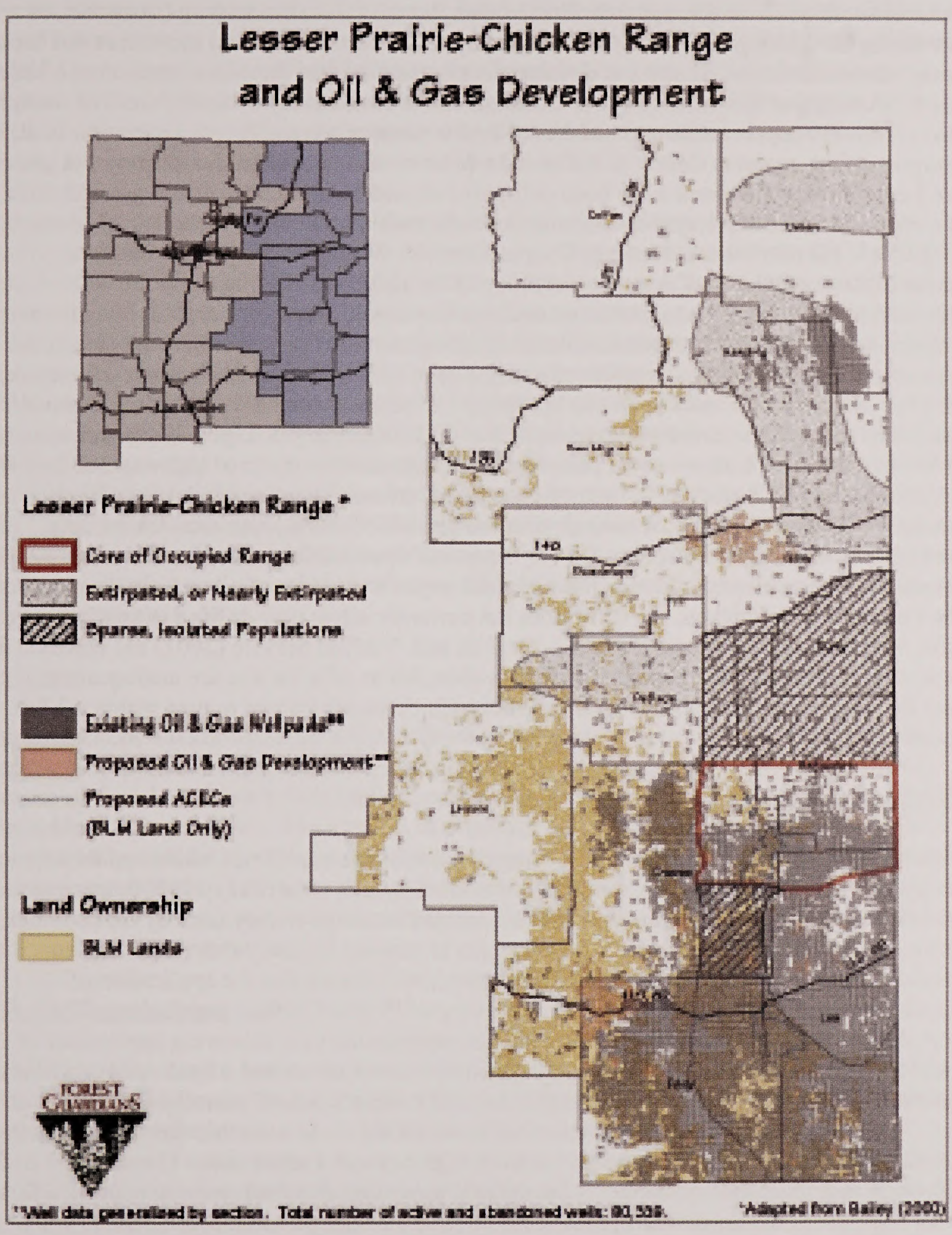


Figure 6. Distribution of Oil and Gas well pads and infrastructure. Lesser Prairie-Chicken habitat inthe east-central and south-eastern portions of the bird's range in New Mexico has been disturbed by over 80,000 oil and gas well pads and accompanying infrastructure.

from areas south of 33^0 N through interference with the male vocalizations and attraction of mates during the lekking season. A recent report by researcher Best (2001) recommended the removal of restrictions on oil and gas development in the Carlsbad Resource Area, in part based on the misconception that Lesser Prairie-Chickens never consistently occupied the area south of highway 380. The report contains a number of faulty assumptions too lengthy to review here, but the purpose of the report is clearly to endorse the position of the petroleum industry, that areas where Lesser Prairie-Chickens have been extirpated should be opened to oil and gas activities. This critique has been supported by a number of independent reviewers, including reviewers from the New Mexico Natural Heritage Program and the Wildlife Management Institute (Johnson 2001 unpublished, Carpenter and Riley 2001 unpublished). The study fails to recommend sound habitat management procedures that would allow for the recovery and re-colonization of birds back into areas of historical occupancy. A few important critiques of the document include; 1) a failure to review the majority of Lesser Prairie-Chicken grey literature, a significant source of information for this species, 2) a failure to consult recognized historical reports from widely cited ornithologists, including F.M. Bailey and J. Ligon 3) an erroneous assertion that Prairie-Chickens never permanently occupied areas south of highway 380 and, 4) incorrect reporting on historical lek activity, including the number of active leks south of highway 380 discovered by BLM biologists in the years 1998-2001, historical lek records between US 82 and the Eddy-Chaves County line, and historical lek records south of US 62-180 (Johnson 2001, unpublished). In recognition of the negative impacts of oil and gas development on the Lesser Prairie-Chicken, the BLM does not currently allow new drilling within 200 m. of a lek site, with certain exceptions. However, the Fish and Wildlife Service (2001) has reported that current restrictions on new oil and gas drilling within 200 m. of a lek site are inadequate to protect the species nesting habitat, because Prairie-Chickens are known to nest within a 3 km. radius of leks.

Applications of Tebuthiuron

In addition to the detrimental effects of grazing noted above, a significant additional adverse effect is the application of tebuthiuron to remove shinnery-oak (Morrissey 1995, Peterson and Boyd 1998, Bailey 1999). This form of land conversion has been widely used by the livestock industry, as well as federal and state land managers to convert shinnery-oak rangelands to grasslands for use by cattle. Jackson and DeArment (1963) found that the application of herbicides was a primary factor limiting the recovery of Prairie-Chicken populations. The authors documented a decrease in Prairie-Chicken numbers the year following application of herbicides, concomitant with a 25% decrease in shinnery-oak cover and a total cessation of acorn production for two years following the application. The importance of shinnery-oak for cover and as a food source has already been described in detail above. In addition, the sandy soils in which Shinnery-oak are found are subject to very high rates of wind erosion. The soil stabilization characteristics of shinnery-oak make it important in natural erosion control, a factor that alone should preclude its widespread removal (R. Peterson, personal communication). Shinnery-oak rarely reproduces sexually, relying primarily on vegetative reproduction to persist (Peterson and Boyd 1998). Historical reports document the failure of shinnery-oak to expand into old fields, even after fifty years and even when the fields are surrounded by mature stands of shinnery-oak (Peterson and Boyd 1998). Therefore, the application of tebuthiuron in shinnery-oak-grassland communities is particularly detrimental to Prairie-Chickens because shinnery-oak

removal is virtually permanent (Peterson and Boyd 1998). Peterson reported that the BLM has applied tebuthiuron to over 404.7 km^2 in east-central and south-eastern New Mexico. Although the BLM halted application of herbicides on the Caprock Management Area beginning at its inception in the 1960s, brush control with tebuthiuron resumed prior to 1984, despite the fact that the BLM's Roswell Area Biologist expressed concern that the use of tebuthiuron may be harming Lesser Prairie-Chicken populations (Morrissey 1995).

A recent BLM proposal to use Tebuthiuron on the Bogle-Vest Camp Allotment in Chaves County, ostensibly for the benefit of the Lesser Prairie-Chicken, shows that the BLM still fails to acknowledge the detrimental effects of Tebuthiuron application on the shinnery-oak-grassland community and the Lesser Prairie-Chicken. The proposed Tebuthiuron application would impact 18.6 km^2 of the total 40.5 km^2 of shinnery (46%) within the allotment. Thus, almost half of the existing community will be affected. The application area is based on the existing BLM guidelines that call for tebuthiuron treatment in areas where the relative density of shinnery oak is greater than 40%, a methodology that is flawed. Because the absolute density of oak is not specified, an area may have very little vegetation at all, but if oak comprises greater than 40% of the relative density of the vegetation, tebuthiuron may be applied (Bailey 1999). The effect of even 'light' tebuthiuron application in halting acorn production in subsequent years has already been addressed. The Environmental Assessment (EA) for the proposed project takes for granted that the proposed action is needed to enhance wildlife habitat, but fails to demonstrate how the proposed action will do so.

Predation

Prairie-chickens are known to have a variety of natural predators within their range in New Mexico. Known Prairie-Chicken predators include coyote, fox, raccoon, snakes and raptors. Because of their large clutch sizes and ground nesting habits, Prairie-Chickens are especially vulnerable to nest predation. The impacts of predators upon Lesser Prairie-Chicken numbers depend on the predator / prey ratio and also on the quality of Prairie-Chicken habitat as it relates to escape cover (Bailey 1999). As habitat becomes degraded by factors such as grazing and brush eradication with tebuthiuron, escape cover quality is also degraded and Prairie-Chickens become more susceptible to predation.

Lack of Adequate Protections

Within New Mexico, the Lesser Prairie-Chicken has state protected status in name only. The Lesser Prairie-Chicken is listed in the state Game Code as a 'protected species' and currently the hunting season on the bird is closed. U.S. Forest Service managed land in New Mexico does not afford the Lesser Prairie-Chicken any special protective status (Morrissey 1995). The U.S. Fish and Wildlife Service has declined statutory protection of this species under the ESA, although the agency admits it warrants listing (USFWS 1998). The New Mexico State Land Office (SLO) holds 21% of the historic range lands of the Lesser Prairie-Chicken. Although the SLO is currently undergoing an internal restructuring to allow for the integration of land management for native flora and fauna, its primary mandate is to generate revenue for state beneficiary institutions (Bailey 1999). As such, the SLO provides no current protections for the Lesser Prairie-Chicken. The New Mexico Department of Game and Fish manages over 85 km2 on 29

PCAs in Roosevelt, De Baca and Lea Counties. Bailey reported that habitat on at least two of the PCAs has been degraded by careless oil and gas development, and that several of the areas are not completely fenced to exclude livestock and trespass cattle and fence repair continues to be a problem (1999, J. Bailey, personal communication). Additionally, these small managed areas are probably not adequate to maintain diverse populations of Lesser Prairie-Chickens in the face of the continued threats to the species throughout its range.

The BLM in New Mexico has done extensive monitoring of Lesser Prairie-Chickens in recent decades (Bailey 1999). The BLM's response to threats facing the Lesser Prairie-Chicken cannot be underestimated, as it controls 19% of the overall historic range and 53% of the historic range of the species in southeastern New Mexico (Bailey 1999). The BLM Roswell Field Office Management Plan / EIS (RMP) restricts oil and gas activities during the mating season in recognition of the probable detrimental effects of oil and gas noise on Prairie-Chicken mating success (RMP AP3-5). Additionally, the BLM will not allow new drilling within 200 m. of a lek site, with certain exceptions. However, the Fish and Wildlife Service (2001) has reported that current restrictions on new oil and gas drilling within 200 m. of a lek are inadequate to protect the species nesting habitat, because Prairie-Chickens are known to nest within a 3 km. radius of leks.

The RMP also commits to avoiding core Prairie-Chicken areas when locating rights-of-way and recognizes Prairie-Chicken needs in defining the BLM's objectives for shinnery-oak-dune communities, RMP 2-71 and RMP 2-47, respectively (Bailey 1999). Unfortunately, BLM guidelines for application of tebuthiuron are still inadequate. The RMP calls for chemical control of shinnery-oak only in areas where oak is greater than 40% of the vegetative community. However, the minimum size area that may be measured for treatment is not specified and neither is the absolute density of oak having greater than 40% of the vegetative composition. Therefore, an area may have very little vegetation at all, but if oak comprises greater than 40% of the relative density of the vegetation, tebuthiuron may be applied (Bailey 1999).

In 1979 the BLM committed to constructing 21 exclosures of 0.08-0.6 km^2 each to provide nesting habitat for the Lesser Prairie-Chicken, a commitment that was never acted upon and finally rescinded in 1984 (Bailey 1999). The BLM also supported the treatment of 404.7 km^2 of shinnery-oak with tebuthiuron during the period 1984-1993 despite objections raised by the NMDGF. Finally, the BLM was to have initiated a study of Prairie-Chicken populations in 1995, but the study was canceled due to budget cuts (Morrissey 1995). The BLM established standards for livestock grazing in January of 2000 and a final Record of Decision was released in 2001, listing the Lesser Prairie-Chicken as a special status species and outlining the prescription for management. However, the management prescription does not recognize the necessity of residual vegetation as wildlife cover, or as nesting cover for the Lesser Prairie-Chicken (BLM 2000, BLM 2001).

Importantly, re-introductions of Prairie-Chickens have been tried over a dozen times, with no success (Giesen 1998 and 2000). Wild Lesser Prairie-Chickens have been translocated in New Mexico and Colorado to areas of the species' historical range where it had been extirpated. Although the normal movements of birds are confined to 3-4 km. of lek sites, with occasional reports of flocks traveling as far as 40 km., translocated birds have traveled hundreds of km. to

return to their points of capture (Taylor and Guthery 1980a).

ACEC Criteria

To be nominated, potential ACECs must meet relevance and importance criteria as outlined in BLM manual 1613. The following narrative will detail the relevance and importance of the proposed Lesser Prairie-Chicken ACEC.

Relevance

The proposed Lesser Prairie-Chicken ACEC meets, at a minimum, three of the relevance criteria as outlined in the BLM Manual 1613 (Criteria 1, 2, and 3). First, the area contains "a significant historical, cultural or scenic value" (Criterion 1). The proposed Lesser Prairie-Chicken ACEC contains a significant historical value in that it is home to a once wide-ranging bird species that has co-evolved with the shinnery-oak grassland ecosystem of eastern New Mexico. Ample historical evidence exists to document the impact of these once abundant birds and their habitat on the historical communities of east-central and southeastern New Mexico (Ligon 1927, Colvin 1914, Ligon 1927, Peterson and Boyd 1998). Colvin (1914) reported that "flocks of 500 or more" birds gathered to feed on the waste grains of the earliest agricultural fields that were converted from the native shrub-grasslands. Writing of the shinnery-oak-grassland community type, Josiah Gregg remarked in 1844:

> There was not a drop of water to be found... An immense sand-plain... being entirely barren of vegetation in some places, while others were completely converted with a extraordinary diminutive growth which has been called *shin-oak*... heavily laden with acorns... (from Peterson and Boyd 1998).

Today, both the once ubiquitous Lesser Prairie-Chicken and the shinnery-oak grasslands they inhabit are dwindling due to land conversion, brush control, livestock grazing and oil and gas development (Copelin 1963, Jackson and DeArment 1963, Crawford 1974, Crawford and Bolen 1976, Taylor and Guthery 1980b, Riley et al. 1992, USFWS 1998, Bailey 1999). The establishment of the proposed Lesser Prairie-Chicken ACEC would help to ensure the preservation of this historical and culturally valuable component of the short-grass prairie of east-central and southeastern New Mexico.

Second, the proposed Lesser Prairie-Chicken ACEC is "a fish and wildlife resource" (Criterion 2). The area includes habitat for many threatened, endangered and sensitive species of wildlife including the Black-tailed Prairie Dog and the Sand Dune Lizard, each of which currently merit listing under the ESA (Table 1). A complete list of shinnery-oak grassland community associates is included in Appendix A.

Table 1. Sensitive species, in addition to the Lesser Prairie-Chicken, within the proposed ACEC. Source: NMNHP NHIS database.

S1 – Critically Imperiled
S2 – Imperiled
S4 – Apparently Secure
B – Breeding
N – Non-breeding

G2- Imperiled
G3- Vulnerable
G4- Apparently Secure
G5- Secure
TU- Subspecies Unrankable

FWS – U.S. Fish and Wildlife Service
USFS – U.S. Forest Service

Species	Federal Listing?	State Listing?	ABI State Rank?	ABI Global Rank?	Sensitive?
Baird's Sparrow (*Ammodramus bairdii*)	N	Threatened	S2N	G4	FWS
Ferruginous Hawk (*Buteo regalis*)	N	N	S2B,S4N	G4	FWS
Western Burrowing Owl (*Athene cunicularia hypugea*)	N	N	S4B,S4N	G4TU	FWS
Swift Fox (*Vulpes velox*)	N	N	S2	G3	USFS
Arizona Black Tailed Prairie Dog (*Cynomys ludovicianus arizonensis*)*	Candidate	N	S2	G4	N
Sand Dune Lizard (*Sceloporus arenicolus*)	Candidate	Threatened	S1	G2	FWS USFS
Texas Horned Lizard (*Phrynosoma cornutum*)	N	N	S4	G4G5	FWS
White-tailed Deer *Odocoileus virginianus texana*	N	Sensitive	S4	G5	N

* Some question still exists about the possible subspecific status of certain populations, especially that in the Tularosa Basin of southern New Mexico (Hubbard 1982). However, the full species is itself a candidate for ESA listing (67 Fed. Reg. 40657-40679 (June 13, 2002)).

Baird's Sparrow – The Baird's Sparrow is an endemic species of the northern Great Plains that winters in southern New Mexico, south-eastern Arizona, western Texas and Northern Mexico (http://mountain-prairie.fws.gov/bairdssparrow/facts.htm). The Baird's Sparrow prefers taller to mixed grass prairie habitat. The bird exhibits little site fidelity from season to season, being found primarily where rangeland conditions are very good to excellent. Baird's sparrow populations have declined throughout the species range due to habitat loss from livestock grazing of grasslands and the conversion of native prairie and grasslands to agricultural lands (http://mountainprairie.fws.gov/bairdssparrow/facts.htm). The nomadic nature of the Baird's Sparrow suggests that the species will become increasingly more rare in southeastern New Mexico as long as the shinnery-oak-grassland community continues to be degraded by livestock grazing and conversion to other uses.

Ferruginous Hawk – The ferruginous hawk is found in open habitats such as grasslands, shrubsteppes, shrublands, deserts, and the outer edges of pinyon-pine forests throughout western North America (http://arnica.csustan.edu/esrpp/fh.htm). The birds are common in New Mexico, including the shinnery-oak-grassland community of south-central and southeastern New Mexico throughout the winter months. Ferruginous hawks depend on only a few prey species, including cottontails, black-tailed jackrabbit, ground squirrels, and pocket gophers (http://arnica.csustan.edu/esrpp/fh.htm). Ferruginous hawk populations continue to decline throughout the species range, principally due to habitat loss through conversion to agriculture and other land uses, livestock grazing of rangelands and population control of the small mammals that serve as the species food source (http://arnica.csustan.edu/esrpp/fh.htm).

Western Burrowing Owl – The burrowing owl is found in the open desert grasslands and shrublands of the American west from Canada to Mexico (http://arnica.csustan.edu/esrpp/burowl.htm). The burrowing owl is capable of digging its own nest sites, but often nests within the abandoned dens of other animals, including prairie dogs. The burrowing owl is an opportunistic feeder, and the many insects of the shinnery-oak-grasslands make up a large part of its diet, as do small ground dwelling mammals such as mice, rats, gophers and squirrels (http://arnica.csustan.edu/esrpp/burowl.htm).

Swift Fox – The Swift Fox occurs within widely scattered and isolated pockets of remnant short and mid-grass prairie throughout the western United States. Swift Fox utilize dens throughout the year, either digging their own or enlarging the burrows of other animals (USFWS 2000). The Swift Fox are opportunistic feeders, and will eat small mammals, birds, insects, fruits and carrion. The Swift Fox has decreased southward from its historical distribution, which was once from Canada to Mexico. Today the species is extirpated from Canada, Montana and the Dakotas, and is found in smaller numbers in Wyoming, eastern Colorado and Kansas, but is found throughout most of its historic range in Oklahoma and New Mexico (USFWS 2000). Swift Fox populations are threatened primarily by conversion of rangeland for agricultural purposes, hunting and the widespread use of strychnine used to kill wolves and coyotes (USFWS 2000).

Arizona Black-tailed Prairie Dog – Prairie dogs are not commonly found within the shinnery-oak-grassland community type and are not found at all in areas where tall grasses are abundant (Peterson and Boyd 1998). Evidence suggests that the presence of prairie dogs in the shinnery-oak-grasslands is the result of livestock grazing of tall grasses, and the destruction of prairie dog predators (Peterson and Boyd 1998). Despite their historical absence from the shinnery-oak-grassland community, prairie dogs have played an important role in the ecology of Lesser Prairie-Chickens in recent times, as their colonies have been known to be associated with lek sites (Davis et al. 1981, Morrissey 1995, Bailey 1999).

Sand Dune Lizard – The sand dune lizard is the only reptile species restricted to the shinnery-oak-grassland community, and within New Mexico the lizard is limited to the south-eastern portion of the state (Peterson and Boyd 1998). The sand dune lizard occurs mainly in deep sand areas, but forages under the shinnery oak and is usually found within 4-6 ft. of an oak (Peterson and Boyd 1998). Treatment of shinnery oak with tebuthiuron is prohibited within the known habitat of the sand dune lizard, but continued livestock grazing as well as oil and gas

development threatens the long term survival of the species (Bailey and Painter 1994).

Texas Horned Lizard – The Texas horned lizard is found throughout large parts of Texas, Oklahoma, Kansas and New Mexico in the arid and semi-arid grassland and shrubland communities. The lizards live primarily in sparsely vegetated, sandy areas with nearby colonizes of harvester (*Pogonomyrmex* spp.) ants http://www.tpwd.state.tx.us/nature/wild/reptiles/thlizard.htm). The lizards are ant specialist feeders and eat primarily harvester ants, but will feed on other insects such as grasshoppers, isopods and beetles (http://animaldiversity.ummz.umich.edu/accounts/phrynosoma/p._cornutum$narrative.html). Texas horned lizard populations have declined recently, principally due to the invasion of the imported fire ant, *Solenopsis invicta*, loss of habitat through land conversion processes, and the use of pesticides on harvester ants (http://animaldiversity.ummz.umich.edu/accounts/phrynosoma/p._cornutum$narrative.html).

White-tailed Deer - The white-tailed deer is thought to be restricted to the shinnery-oak-grasslands within New Mexico, and the shinnery-oak-grassland is the principal community type that harbors this subspecies throughout its range in the southern Great Plains (Peterson and Boyd 1998). The acorns of shinnery oak are a principal food source for the White-tailed Deer, along with forbs and other plants of the shinnery-oakgrasslands. There is some confusion as to the subspecies present in the shinnery-oakgrasslands of New Mexico. Bailey (1905) and Ligon (1927) ascribed the white-tailed deer to its own seperate subspecies, while modern sources typically describe the species as a member of the subspecies *texanus* (NMNHP database, unpublished).

The continuing degradation of the shinnery-oak-grassland community type, considered together with the fact that the New Mexico BLM controls almost 75% of the remaining Prairie-Chicken habitat in public ownership makes the proposed Lesser Prairie-Chicken ACEC invaluable for maintaining biodiversity within the shinnery-oak-grassland ecosystem of east-central and southeastern New Mexico and in promoting the recovery and continued existence of the Lesser Prairie-Chicken as well as the additional sensitive species described above.

Finally, the proposed Lesser Prairie-Chicken ACEC is important as "a natural process or ecosystem" (Criterion 3). The area contains the majority of the remaining shinnery-oak-grassland habitat on public lands that the Lesser Prairie-Chicken requires for survival within its range in New Mexico. This habitat is becoming increasingly degraded through brush control, land conversion, livestock grazing and oil and gas development (Bailey 2000, USFWS 1998, Riley et al. 1992, Taylor and Guthery 1980b, Copelin 1963, Jackson and DeArment 1963, Crawford and Bolen 1976, Crawford 1974). Because the vast majority of this ecosystem exists on private lands that are largely unregulated, the proposed Lesser Prairie-Chicken ACEC is critical in maintaining and restoring the historical quality and health of the shinnery-oak-grassland ecosystem, and preserving this habitat for both the survival of the Lesser Prairie-Chicken and as a reservoir of biodiversity for this threatened ecosystem.

Importance

The proposed Lesser Prairie-Chicken ACEC meets, at a minimum, two of the importance criteria as outlined in the BLM Manual 1613 (Criteria 1 and 2). First, the area contains "more than locally significant qualities which give it special worth, consequence, meaning, distinctiveness, or cause for concern, especially compared to any similar resource" (Criterion 1). The Lesser Prairie-Chicken's original range encompassed 358,000 km^2 throughout eastern New-Mexico, the Texas panhandle, western Oklahoma, southwestern Kansas and southeastern Colorado, with small populations possibly existing in northeastern Colorado and extreme northwestern Nebraska (Colvin 1914, Ligon 1927, Bailey 1928, Taylor and Guthery 1980b, Morrissey 1995). Today, its known range has been reduced by 92%, and of the species remaining range, only 5% remains in public ownership. Significantly, of the remaining lands in public ownership, the New Mexico BLM controls almost 75%, thereby making the proposed Lesser Prairie-Chicken ACEC regionally important as both a habitat reserve and "genetic bank" vital to the survival and recovery of the species over its entire current and former range (Taylor and Guthery 1980b). Additionally, the continued degradation of this public rangeland through livestock grazing, brush control, oil and gas development and land conversion makes the area an immediate cause for concern. Finally, as the remaining BLM lands represent the majority of Prairie-Chicken habitat on public lands, the proposed Lesser Prairie-Chicken ACEC clearly has special worth compared to similar resources, the majority of which exist on private lands. The area is already, and continues to be of major interest to birdwatchers worldwide, who visit the Caprock Wildlife Area from around the world (Dr. Kris Johnson, personal communication).

Second, the area "has qualities or circumstances that make it fragile, sensitive, rare, irreplaceable, exemplary, unique, endangered, threatened, or vulnerable to adverse change" (Criterion 2). The Fish and Wildlife Service, in reviewing the 1995 petition to list the Lesser Prairie-Chicken as endangered or threatened, gave the petition a "warranted, but precluded" ruling, and continues to find the species imperiled, acknowledging:

> "based on all currently available information, we find that the threats to the Lesser Prairie-Chicken, as outlined in the 12-month finding, remain unchanged and Lesser Prairie-Chickens continue to warrant federal listing as threatened" (Fish and Wildlife Service 2001).

The proposed Lesser Prairie-Chicken ACEC contains the majority of the remaining shinnery-oak-grassland habitat on public lands that the species requires for survival within its range in New Mexico. This habitat is increasingly subject to eradication through the use of tebuthiuron for conversion to grasslands for cattle grazing, both on public and private lands. The continued degradation of this area through brush control, livestock grazing and oil and gas development clearly makes it both "fragile" and "vulnerable to adverse change", as has been repeatedly documented (Copelin 1963, Jackson and DeArment 1963, Crawford 1974, Crawford and Bolen 1976, Taylor and Guthery 1980b, Riley et al. 1992, USFWS 1998). Finally, the well-documented failure of shinnery-oak to revegetate areas that have been converted to other land uses clearly makes the shinnery-oak-grassland habitat within the proposed Lesser Prairie-Chicken ACEC "irreplaceable" (Peterson and Boyd 1998).

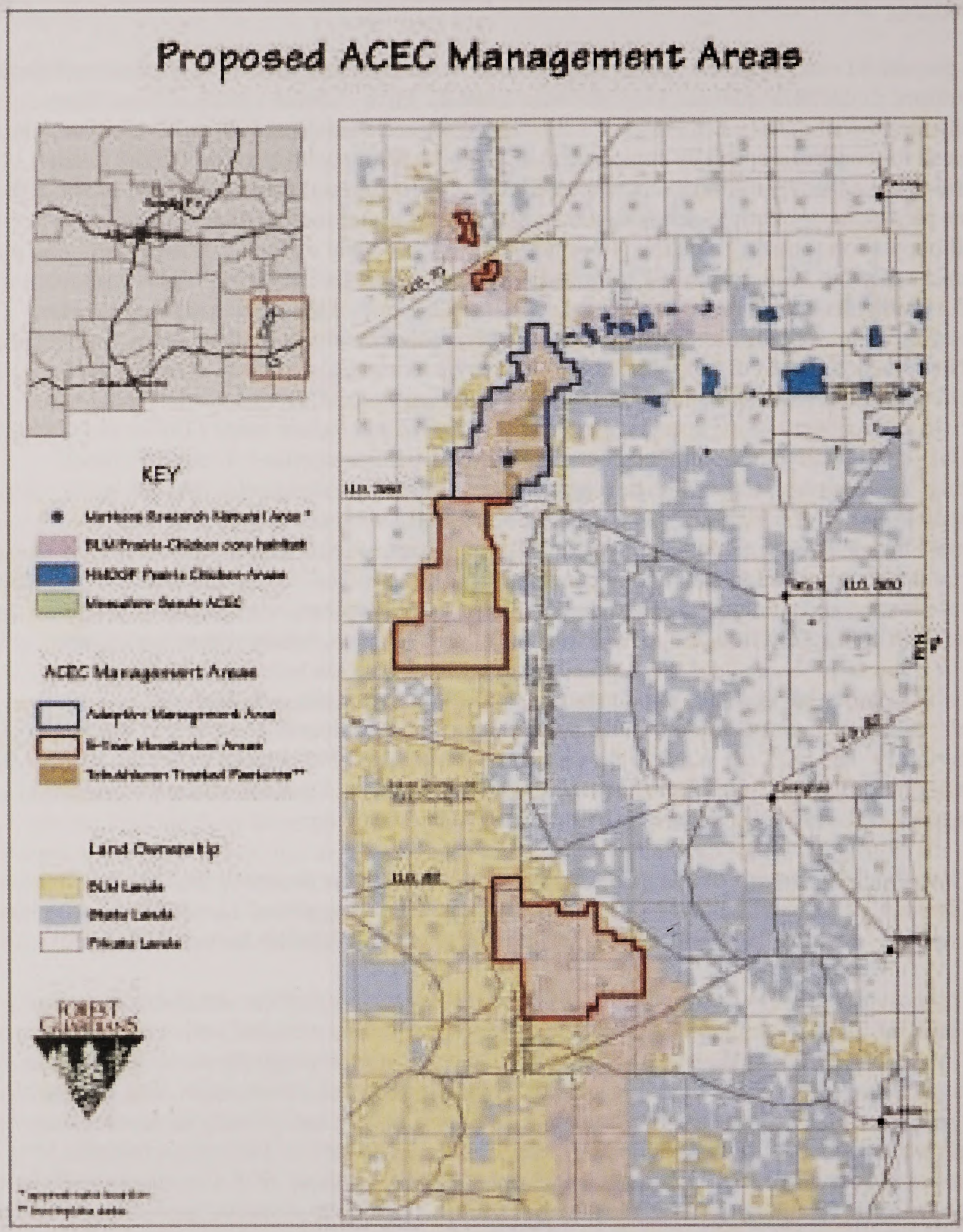


Figure 7. Management areas for BLM Lands within the proposed Lesser Prairie-Chicken ACEC. Two different management areas are proposed by the petitioners. The Adaptive Management Area contains stable populations and is designed to develop a management plan for the ACEC. The 5-year moratorium areas target populations where conditions are critical and emergency protections are needed.

Suggestions for Special Management

The petitioners propose the following management recommendations for the proposed Lesser Prairie-Chicken ACEC. The petitioners believe that in order to ensure proper management, a committee of state, federal and academic wildlife specialists should be convened to draft a comprehensive adaptive management plan for the shinnery-oak grassland ecosystem and Lesser Prairie-Chicken habitat within the proposed Lesser Prairie-Chicken ACEC. The primary and overriding purpose of all management actions undertaken by this committee or by the agency within the ACEC boundaries must be to recover and sustain Lesser Prairie-Chicken populations. The committee should also reconvene on a regular basis to systematically review the results of the management plan and implement any necessary changes.

The petitioners propose that the committee should develop and implement an adaptive management strategy for the Lesser Prairie-Chicken ACEC, with the following guidelines. In light of the continuing decline of Prairie-Chicken population numbers and habitat conditions, the petitioners have delineated areas of critical importance, where populations are sparse and disconnected and/or extirpation is imminent (Moritorium Areas, Figure 7). These areas include the populations south of highway 380 and north of 33^0N, the Querecho Plains populations and adjacent historic habitat, and the isolated northern populations adjacent to U.S. 70. Within these areas, the petitioners propose a 5-year moratorium on livestock grazing, as well as new oil and gas activity to allow for an emergency habitat recovery period. Monitoring of habitat conditions and Lesser Prairie-Chicken leks should be used to test the hypothesis that conditions for the species will improve during the 5-year moratorium.

The remaining portion of the proposed Lesser Prairie-Chicken ACEC contains the "core" populations of the Lesser Prairie-Chicken, and consists mainly of the Caprock Wildlife Area (Figure 7). Lesser Prairie-Chicken populations in this area are more stable and in less imminent danger, therefore the petitioners propose that this area be used to test adaptive management methodologies for enhancing and sustaining Lesser Prairie-Chicken habitat. These methodologies may include conservative livestock grazing, as well as herbicide applications, so long as the activities promote the recovery and stability of Lesser Prairie-Chicken populations. All management strategies implemented by the committee within the Adaptive Management Area should be applied with rigorous experimental design. It is the belief of the petitioners that this Adaptive Management Area can be used to develop sound criteria for recovering Lesser Prairie-Chickens, and that these criteria can then be applied to the other parts of the proposed Lesser Prairie-Chicken ACEC, once the emergency moratorium has ended. The Petitioners respectfully furnish the following list of suggestions for testing within the Adaptive Management Area based on eliminating the previously mentioned threats to the Lesser Prairie-Chicken:

1. Experimental reductions in livestock grazing within the Adaptive Management Area of the proposed Lesser Prairie-Chicken ACEC. Active lek sites should be used as experimental unit; with treatments applied to randomly selected, geographically independent lek sites. A minimum of five lek sites should be used for each grazing treatment. Treatments should include no grazing on at least 2.6 km^2 within 2.4 km. of lek sites and light intensity grazing (after June 30) on at least 2.6 km^2 within 2.4 km. of lek sites.

2. A permanent ban on the use of Tebuthiuron. The lethality of the herbicide tebuthiuron on shinnery oak precludes its safe application. If herbicides are deemed useful by the management team to retard growth of shinnery oak and promote grass cover, other less lethal herbicides should be used in place of tebuthiuron.
3. An expansion of the restrictions on certain oil and gas related activities during the lekking season. Based on the USFWS 2001 report, current restrictions on new oil and gas drilling within 200 m. of a lek are inadequate to protect the species, which is known to nest within 3 km. of a lek. These restrictions should be extended to areas within a minimum of 1.5 km. of an active lek.
4. Special management of the corridor areas that link the known east-central and southeast populations of Lesser Prairie-Chicken to facilitate migration and genetic exchange between these increasingly fragmented populations.
5. Encourage the use of the Conservation Reserve Program for any qualifying adjacent state and private lands within the external boundaries of the proposed Lesser Prairie-Chicken ACEC, to facilitate recovery of healthy shinnery-oak grassland community conditions on non-public land.
6. Pursue the acquisition of private lands from willing sellers, as well as land exchanges with the New Mexico State Land Office within the boundaries of the proposed Lesser Prairie-Chicken ACEC.

The Adaptive Management Area also contains a number of large, tebuthiuron treated pastures where high concentrations of the herbicide were applied (Figure 7). These areas have been treated to enhance conditions for livestock grazing and surveyors have repeatedly failed to locate birds nesting or raising broods within the treated pastures (K. Johnson, personal communication). Therefore, the petitioners suggest that these areas be exempt from the livestock management recommendations discussed here, and that livestock grazing simply comply with all applicable federal law in these areas.

In addition to the recommendations above, the petitioners also respectfully submit the following recommendations to apply to BLM lands within the whole of the proposed Lesser Prairie-Chicken ACEC:

1. All of the area within the proposed Lesser Prairie-Chicken ACEC should be withdrawn from "locatable mineral" entry, non-energy mineral leasing and salable mineral entry.
2. Collection of plant material should be prohibited unless authorized by special permit, and then only for educational or scientific applications.
3. Vehicular traffic should be restricted to "designated" roads only, all other roads should be closed to all but administrative uses.
4. Recreational activity and access to the proposed Lesser Prairie-Chicken ACEC should be limited during the lekking season by special permit.
5. Management for recreational purposes should be limited to primitive recreational opportunities only.
6. No authorizations for new rights of way within 1.5 km of an active lek should be allowed.
7. The intentional introduction of any exotic plants or animals should be prohibited.

Conclusion

The protection of habitat on a large enough scale to protect ecosystem processes and allow for the continuation of stable community structures with a minimum of outside intervention is increasingly recognized as critical for the long-term survival of at-risk species (Soule and Simberloff 1986, Soule et al. 1992). The Lesser Prairie-Chicken populations of east-central and southeastern New Mexico occupy the largest remaining area of relatively intact shinnery-oak-grassland habitat on public lands (USFWS 1998, Bailey 1999). The majority of existing Prairie-Chicken habitat occurs on private land. Due to the limited feasibility of regulating activities on private lands, the prospects for recovering the species in these areas are less hopeful than on public land. This further elevates the relative importance of public lands for recovering the species. The New Mexico BLM controls almost 75% of the species' remaining habitat that is in public ownership, making the proposed Lesser Prairie-Chicken ACEC one essential component to the recovery of the species over its entire current and former range (Taylor and Guthery 1980b). The petitioners believe that the proposed Lesser Prairie-Chicken ACEC is on a scale large enough to provide for the recovery and maintenance of stable Lesser Prairie-Chicken populations in a fully functioning ecosystem. The unique combination of factors affecting the survival of the Lesser Prairie-Chicken presents an outstanding opportunity for the BLM to take the lead in conserving and recovering this species and for protecting the shinnery-oak-grassland ecosystem it inhabits.

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Appendix A. Wildlife Species of Chaves, Eddy and Lea Counties, NM; Shinneryoak-grassland associates

Source: Biota Information System of NM (http://fwie.fw.vt.edu/states/nm.htm)

Species Common Name	Species Scientific Name
Tiger Salamander	*Ambystoma tigrinum*
Couch's Spadefoot	*Scaphiopus couchii*
Plains Spadefoot	*Spea bombifrons*
New Mexico Spadefoot	*Spea multiplicata*
Ornate Box Turtle	*Terrapene ornata*
Collared Lizard	*Crotaphytus collaris*
Longnose Leopard Lizard	*Gambelia wislizenii*
Greater Earless Lizard	*Cophosaurus texanus*
Lesser Earless Lizard	*Holbrookia maculata*
Texas Horned Lizard	*Phrynosoma cornutum*
Roundtail Horned Lizard	*Phrynosoma modestum*
Sand Dune Lizard	*Sceloporus arenicolus*
Eastern Fence Lizard	*Sceloporus undulatus*
Side-blotched Lizard	*Uta stansburiana*
Chihuahuan Spotted Whiptail	*Cnemidophorus exsanguis*
Prairie Racerunner	*Cnemidophorus sexlineatus* viridis
Great Plains Skink	*Eumeces obsoletus*
Texas Blind Snake	*Leptotyphlops dulcis* dissectus
Glossy Snake	*Arizona elegans*
Ringneck Snake	*Diadophis punctatus*
W. Hognose Snake	*Heterodon nasicus*
Night Snake	*Hypsiglena torquata*
Desert Kingsnake	*Lampropeltis getula* splendida
Milk Snake	*Lampropeltis triangulum*
Coachwhip	*Masticophis flagellum*
Gopher Snake	*Pituophis melanoleucus*
Texas Longnose Snake	*Rhinocheilus lecontei*
Ground Snake	*Sonora semiannulata*
Plains Blackhead Snake	*Tantilla nigriceps*
W. Diamondback Rattlesnake	*Crotalus atrox*
Western Rattlesnake	*Crotalus viridis*
Desert Massasauga	*Sistrurus catenatus* edwardsii
Turkey Vulture	*Cathartes aura*
Swainson's Hawk	*Buteo swainsoni*
Red-tailed Hawk	*Buteo jamaicensis*
Ferruginous Hawk	*Buteo regalis*
Golden Eagle	*Aquila chrysaetos* canadensis
Merlin	*Falco columbarius*
Lesser Prairie-Chicken	*Tympanuchus pallidicinctus*
Great-horned Owl	*Bubo virginianus*

Northern Flicker *Colaptes auratus*

Appendix A. Wildlife Species of Chaves, Eddy and Lea Counties, NM; Shinnery-oakgrassland associates. Source: Biota Information System of NM (http://fwie.fw.vt.edu/states/nm.htm)

Species Common Name	Species Scientific Name
Scissor-tailed Flycatcher	*Tyrannus forficatus*
Dark-eyed Junco	*Junco hyemalis*
Brown-headed Cowbird	*Molothrus ater*
Desert Cottontail Rabbit	*Sylvilagus audubonii*
Thirteen-lined Ground Squirrel	*Spermophilus tridecemlineatus*
Ord's Kangaroo Rat	*Dipodomys ordii*
N. Grasshopper Mouse	*Onychomys leucogaster*
Coyote	*Canis latrans*
Kit Fox	*Vulpes macrotis*
Swift Fox	*Vulpes velox*
Common Gray Fox	*Urocyon cinereoargenteus* scottii
American Badger	*Taxidea taxus berlandieri*
Mule Deer	*Odocoileus hemionus*
White-tailed Deer	*Odocoileus virginianus* texana
Jerusalem Cricket	*Stenopelmatus mescaleroensis*

Appendix 4



APPENDIX 4
USFWS POLICY FOR EVALUATING CONSERVATION EFFORTS

PECE – POLICY ON EVALUATION CONSERVATION EFFORTS

When determining whether listing a species is warranted under the Endangered Species Act (ESA), the US Fish and Wildlife Service evaluates all the threats to the species and also evaluate all conservation efforts. Conservation efforts that have been or are being implemented, and for which effectiveness is known, often play an important role in reduction threats to a species. In addition, conservation efforts that have not yet been implemented or have not yet demonstrated effectiveness may play a role in reducing threats to the species. The Policy on Evaluating Conservation Efforts (PECE) (68 FR 15100; March 28, 2003) provides a policy framework and criteria for evaluating this second category, i.e. those conservation efforts that have not yet been implemented or have not yet demonstrated effectiveness.

We use PECE to evaluate whether a conservation effort is sufficiently certain to be implemented and sufficiently certain to be effective so as to have reduced or removed a threat to the species. PECE applies to formalized conservation efforts, which are defined as "conservation efforts identified in a conservation agreement, plan, management plan or similar document. An agreement or plan may contain numerous conservation efforts." Because certainty of effectiveness and implementation will vary among efforts, we evaluate each conservation effort individually. Again, PECE is not used to evaluate conservation efforts that are already being implemented and for which effectiveness is known.

In evaluating whether there is sufficient certainty of implementation, we use the following PECE criteria:

1. The conservation effort, the party(ies) to the agreement or plan, and the staffing, funding level, funding source and other resources necessary to implement the effort are identified.
2. The legal authority of the party(ies) to implement the effort and the commitment to proceed with it are described.
3. Legal procedural requirements (e.g. environmental review) necessary to implement the effort are described, and information is provided indicating the fulfillment of these requirements does not preclude commitment to the effort,
4. Authorizations necessary to implement the effort are identified (e.g. permits, landowner permission), and a high level of certainty is provided that the authorizations will be obtained.
5. The type and level of voluntary participation necessary for implementation is identified (e.g. the number of participants agreeing to alter management practices and the acres involved), and a high level of certainty is provided that this level of voluntary participation will be obtained.
6. Regulatory mechanisms necessary to implement the effort are in place (e.g. laws, regulations).
7. A high level of certainty is provided that the necessary funding to implement the conservation effort will be obtained.
8. An implementation schedule, including incremental completion dates, is provided.
9. The conservation agreement or plan is signed/approved by all responsible parties.

In evaluation whether there is sufficient certainty of effectiveness, we use the following PECE criteria:

1. The nature and extent of threats being addressed are described, and how the conservation effort reduces the threats.
2. Explicit incremental objectives for the conservation effort and dates for achieving them are stated.
3. Steps necessary to implement the conservation effort are identified in detail.
4. Quantifiable, scientifically valid parameters that will demonstrate achievement of objectives, and standards by which progress will be measured, are identified.
5. Provisions for monitoring and reporting progress on implementation and effectiveness are provided.
6. Principles of adaptive management are incorporated.

In addition to criteria described above, we may consider other factors as appropriate.

US Fish and Wildlife Service – March 4, 2004

Appendix 5



APPENDIX 5
RECLAMATION AND BEST MANAGEMENT PRACTICES

INTRODUCTION

The BLM would incorporate appropriate Best Management Practices (BMPs) into proposed Applications for Permit to Drill (APDs) and associated rights-of-way (ROW) approvals after appropriate National Environmental Policy Act (NEPA) evaluation. BMPs are innovative, dynamic, and economically feasible mitigation measures applied on a site-specific basis to reduce, prevent, or avoid adverse environmental or social impacts. BMPs are applied to management actions to aid in achieving desired outcomes for safe, environmentally sound resource development by preventing, minimizing, or mitigating adverse impacts and reducing conflicts.

The early incorporation of BMPs into APDs by the oil and gas operator helps to ensure an efficient and timely APD process. The BLM has developed BMPs specific to public land management in the Planning Area. The BMPs listed in this appendix are not inclusive and are expected to change as both BLM and operators gain experience. BMPs would be applied as Conditions of Approval (COAs) on APDs and as stipulations attached to ROW grants.

The BLM would link rehabilitation requirements to the native vegetative species that are growing adjacent to disturbed sites. This would be done at the Notice of Staking (NOS) or APD Pre-Drill onsite inspection stage. There would also be an assessment of the potential for successful reclamation of proposed well pad sites and ROWs, and relocation of these proposed locations would be considered as needed.

RECLAMATION

The BLM has a statutory mandate to ensure reclamation and closure of oil and gas operations are completed in an environmentally sound manner. The BLM's requirements for reclamation are to shape, stabilize, revegetate, or otherwise treat disturbed areas in order to provide a productive use of the land which conforms to the approved land-use plan for the area. Short-term reclamation requirements are to stabilize disturbed areas and to protect both disturbed and adjacent undisturbed areas from unnecessary and undue degradation. The BLM reclamation practices are derived from the Solid Mineral Reclamation Handbook H-3042-1. This handbook provides reclamation information and guidance applicable to various situations and conditions.

The Roswell RMP and the Carlsbad RMP for Fluid Minerals Leasing places great emphasis on successful reclamation. A primary purpose of the BLM's reclamation program is to stabilize the surface against the long-term effects of erosion. Another major objective is to return the site to a productive post-operational use that reflects the pre-disturbance conditions.

A reclamation plan would be part of the Surface Use Plan of Operation (SUPO). This outcome-oriented reclamation plan could be amended to incorporate increased expectations based on the outcomes of similar reclamation activities. The BLM would monitor the effectiveness and success of reclamation activities during exploration, construction, production, and abandonment of oil and gas associated development. The BLM is also committed

to monitor and evaluate reclamation efforts and incorporate that information into future reclamation practices. This would be an ongoing process and would incorporate industry's successes and failures, as well as any information that is available from ranchers in the area of development and information provided by individuals, academia, or other agencies.

The BLM would continue to seek partnerships with academic and research institutions to refine and improve rehabilitation techniques and materials for the public lands that are arid or semiarid.

Reclamation would be considered successful when healthy, mature native perennials are established with a composition and density that closely approximates the surrounding vegetation as prescribed by the BLM, and the reclamation area is free of noxious weeds. All operations are covered by a bond as required by 43 CFR 3104.1.

The BLM believes that a result of the criteria developed through this planning effort industry would be required to ensure reclamation, even when climatic conditions make it difficult.

The BLM would tie rehabilitation requirements to historic and present knowledge of the native vegetative species that are growing adjacent to the disturbed sites.

A number of standard practices which have proven beneficial to successful reclamation have been identified by the Pecos District Office and are summarized below. These standards should be incorporated into an operator's reclamation plan as applicable to specific-site conditions.

<u>General Principles:</u>

1. Total surface disturbance would be minimized.

2. Topsoil must be removed and stockpiled at the site or well pad prior to construction for reapplication during reclamation.

3. Closely match and restore original topographic contours prior to reapplication of topsoil.

4. Erosion control measures would be utilized as necessary (water bars, slope reduction, contouring, terracing, etc.).

5. Noxious weeds must be controlled at all times. In some situations an operator may be required to:

   - Control weeds on disturbed lands which include the roads, pads and associated pipelines and on adjacent lands affected by the establishment of weeds.
   - Clean all equipment and vehicles with either high pressure water or air prior to entering the site for maintenance and administration of the access roads, well pad, and resulting well.

6. Revegetation success would be evaluated using performance-based standards. Parameters would include the percent basal cover of mature approved species as compared to an adjacent undisturbed area. Operators would be required to use any means necessary within state and Federal laws to achieve acceptable revegetation including irrigation if rainfall during the growing season proves insufficient.

7. The BLM would continue to engage partners to leverage funding of approved practices including participation at on-site inspections, monitoring development activities, and evaluating the final reclamation of disturbed sites.

Well Pad Reclamation:

1. Following completion of a producing well, the well pad would be reduced in size to the minimum area required for actual operation of the well. Reclamation of native vegetation would be initiated prior to or by the beginning of the next growing season.

2. Reserve pits must be dry prior to backfilling.

3. Proper disposal methods of debris and other trash including all toxic products would be utilized.

4. The Oil Conservation Division's rules on pits and below grade tanks would be utilized in the Planning Area.

5. Seeded areas would be fenced to exclude cattle and sheep for the duration of the revegetation process. The fence would be removed from the site after it is revegetated to an acceptable condition. The reclamation would not be complete until the fence is removed.

6. The BLM or operators may establish pilot plots to evaluate different reclamation methods and seek improved reclamation techniques

7. During vegetative reclamation of a well pad, a BLM-standard four-strand barbed wire fence on cattle allotments and a woven wire fence on sheep allotments would be constructed to exclude livestock until revegetated to an acceptable condition.

8. Upon abandonment and reclamation of the well, the surface material (caliche/gravel) shall be removed from the well pad prior to seeding.

Road Reclamation:

1. Measures to prevent vehicle travel (such as fencing, barricades, signage, contouring, and hummocks) would be utilized on roads during the reclamation process.

2. Upon abandonment and reclamation of the well, the surface material (caliche/gravel) shall be removed from the access road prior to seeding.

Pipeline Reclamation:

1. Disturbed working-area width would be kept to a minimum and outside limits flagged prior to beginning construction.

2. Topsoil must be removed and windrowed for reapplication after backfilling.

3. Backfill in the trench would be compacted in lifts and topsoil reapplied to the surface.

Seed Mixes:

1. Operators would use the BLM-prescribed seed mixes, appropriate to soils and ecological site descriptions for the location.

2. BLM would experiment with different mixes to improve chances for successful reclamation.

SURFACE USE AND BEST MANAGEMENT PRACTICES

Introduction

The locations of well sites are dictated by the geologic target to be drilled and the need to avoid unnecessary surface

disturbance. Environmentally "ideal" locations for construction activities are not always coincident with the geologic target, and avoidance of damage to surface resources is not always possible. However, where well sites cannot be otherwise modified, special practices or construction techniques would be employed to minimize those impacts. This section describes various types of practices that are designed to minimize surface disturbance and effects on other resources and retain the reclamation potential of the disturbed area. These practices may be general and apply regionally, or may be more specific and apply to a particular area or site. The practices represent effective and practical means of accomplishing the requirements of the BLM and should be used as a guide when preparing plans and details that are specific to individual projects.

Generally, the practices described in this appendix have been accepted and employed by industry for similar projects and/or have been derived from this Resource Management Plan Amendment (RMPA) analysis in response to issues identified during scoping and to address impacts identified during analysis.

The standard practices in this appendix should not be construed as rigid requirements that would be applicable to every situation. Rather, the ideas presented in this section communicate philosophy, approach, and examples that have been successful from which site-specific applications can be developed. The operator and surface-management agency working together can develop the best approach to achieve the management objectives in each situation.

While operations of Federal fluid mineral leases are managed by the BLM, the operations are managed in cooperation with the surface-management agency or surface owner, if it is other than the BLM, in order to guide surface use and management. Where the surface is privately owned, the operator is responsible for attempting to reach an agreement with the private surface owner. Surface use guidance and best management practices relevant to Federal fluid minerals are described briefly below.

Surface Use Guidance

Onshore Oil and Gas Orders

Every oil and gas operation authorized under a Federal fluid minerals lease must comply with Federally mandated regulations and orders. Procedures are established for exploration of Federal oil and gas reserves in a series of Onshore Oil and Gas Orders, which are authorized by Title 43, Code of Federal Regulations (CFR) Parts 3160 and 3180. These orders detail uniform national standards for minimum levels of performance expected from lessees and operators when conducting oil and gas activities on Federal and Indian lands. Two orders are particularly relevant to determining the potential for environmental impacts associated with a proposed project. These are Onshore Oil and Gas Order Nos. 1 and 2.

Onshore Order No. 1 requires lessees and operators to conduct their exploration, development, production, and abandonment operations in a manner as follows:

- conform with applicable Federal laws and regulations and with State and local laws and regulations to the extent that such State and local laws are applicable to operations on Federal or Indian leases
- conform with the lease terms, lease stipulations, and conditions of approval
- ensure diligent development and efficient resource recovery
- protect the lease from drainage
- afford adequate safeguards for the environment
- ensure proper reclamation of disturbed lands
- conform with currently available technology and practice

- ensure that underground sources of fresh water would not be endangered by any fluid injection or production operations
- otherwise ensure the protection of public health and safety

The order holds the lessee "fully accountable for their contractors' and subcontractors' compliance with the requirements of the approved permit and/or plan." Onshore Order No. 1 specifically requires survey work and a related report if the surface management agency has reason to believe that properties listed or eligible for listing, in the National Register of Historic Places are present in the area of potential effect. The order also requires the surface-management agency to identify any threatened and endangered species and/or critical habitat problems and other environmental concerns (e.g., wilderness and wilderness study areas, known or potential surface geological hazards, etc.).

BLM Manual 3160 provides guidelines and procedures for processing Applications for Permits to Drill (APDs) and subsequent operations. BLM Manual Handbook 3160-1 provides guidelines for review of technical and environmental considerations for APDs and subsequent activities. Onshore Order No. 2 establishes specific and detailed requirements along with minimum standards for the following:

- well control during drilling
- casing and cementing
- drilling mud and circulating system
- drill-stem testing
- special drilling operations
- blowout preventer equipment to prevent the uncontrolled release of formation fluids to the surface
- related surface use
- abandonment of drilling operations

In some instances, Onshore Order No. 2 relies on existing standards prepared by the American Petroleum Institute, Occupational Safety and Health Administration, and other organizations or agencies.

Onshore Order No. 6 addresses operations with hydrogen sulfide (H_2S) associated when drilling, completing, testing, reworking, producing, injecting, gathering, storing, or treating operations are being conducted in zones that are known or reasonably could be expected to contain H_2S or that when flared, could produce sulfur dioxide (SO_2) in such concentrations that, upon release, could constitute a hazard to human life.

Standard Lease Terms

Standard lease terms, which are disclosed on the standard lease forms, indicate that the operator is responsible for diligent development and for conducting operations in a manner that minimizes adverse impacts on resources anywhere within the leasehold. Copies of Standard Form 3100-11, Offer to Lease and Lease for Oil and Gas, and Form 3200-24, Offer to Lease and Lease for Geothermal Resources are available at the BLM offices.

In addition to the standard lease terms and conditions, the BLM Authorized Officer may require site-specific mitigation at the time of an APD at a specific site. These mitigation measures would be attached to the APD as conditions of approval (described below).

Lease Stipulations

Constraints in the form of stipulations are conditions included in a lease when environmental and planning analyses have demonstrated that additional and more stringent environmental protection is needed. Stipulations are provisions that modify the standard lease rights and are attached and made part of the lease. The operator would be expected to comply with the stipulations specific to resource concerns that are attached to a lease.

Surface Operating Standards

Conditions of Approval

Additional constraints may be necessary if the authority to manage the activity on the lease does not already exist under laws, regulations, or orders.

Constraints in the form of conditions of approval of an APD are site-specific requirements or measures imposed to protect resources or resource values. Conditions of approval must be reasonable and consistent with lease rights. The Authorized Officer has the right to relocate proposed facilities, control timing of operations, and impose other mitigation in accordance with Sections 2 and 6 of the standard oil and gas lease terms (BLM Forms 3100-11 and 3200-24).

BEST MANAGEMENT PRACTICES

More specific to a region or area, a surface-management agency may have standards, or best management practices, to which an operation should conform. While the goals and philosophies regarding surface management are similar in intent, the operator must be responsible for understanding the requirements of the pertinent surface-management agency. Knowledge of the management plans of the surface-management agency, as well as agency operational standards, procedures, and environmental protection requirements, would help an operator meet these standards. The best management practices described below were developed by the BLM, Pecos District Office for this RMPA/EIS.

Best Management Practices For The Planning Area

The best management practices described below apply to any fluid minerals project on public land within the Planning Area, and supplement the standards and guidelines from sources described above.

Preliminary Investigations

Activities occurring during preliminary investigations may include remote sensing; mapping of rock outcrops and seeps (either of which result in little or no surface disturbance); and seismic, gravity, and magnetic surveys. A lease is not required to conduct such preliminary investigations. However, the geophysical operator is required to file a completed Form 3150-4, "Notice of Intent to Conduct Oil and Gas Exploration Operations for all operations on public lands.

In general, the BLM requires an examination of resource values and development of appropriate surface protection and reclamation measures prior to the geophysical contractor beginning surface disturbing activities associated with preliminary investigations. The BLM would solicit involvement from public land users (*e.g.*, grazing allottees) to develop site-specific protection measures and reclamation specifications. Compliance monitoring should occur during and after seismic exploration activities when necessary. Compliance inspections during the operation ensure that requirements and guidelines are being followed. Compliance inspections upon completion of work ensure that the lines are clean and drill holes are plugged properly.

The BLM would consider other BMPs on a case-by-case basis depending on their effectiveness, the balancing of increased operating costs vs. the benefit to the public and resource values, the availability of less restrictive mitigation alternatives, and other site-specific factors. Examples of typical case-by-case BMPs include, but are not limited to the following:

- Reclamation efforts are site-specific and initial requirements would be determined by the BLM Authorized Officer
- Minimizing well pad size by leveling or clearing only what is needed for the rig, pits, and tanks
- Installation of raptor perch avoidance on power poles
- Burying of distribution power lines and/or flow lines adjacent to access roads in certain habitat types.
- Centralizing production facilities
- Utilization of submersible pumps
- Belowground wellheads
- Drilling multiple wells from a single pad
- Noise reduction techniques and designs
- Wildlife monitoring
- Seasonal restriction of public vehicular access;
- Avoiding placement of production facilities on hilltops and ridgelines;
- Screening facilities from view;
- Bioremediation of oil field wastes and spills
- Use of common utility or right-of-way corridors
- Build the shortest road possible utilizing existing road networks. Select road routes that would create less overall surface disturbance. Construct a travel way which creates the smallest possible surface disturbance in width.
- Road surfacing should be limited to soils and topography that require surfacing to reduce soil erosion. As a general rule, if spur roads require surfacing, then the minimum compacted layer of surface material should be applied.
- Surfacing material may not be required on new access road travel ways.
- Reserve pits should be constructed so that upon completion of drilling operations, the dried pit contents would be a minimum of three feet below ground level. Also refer to New Mexico Oil Conservation Division (NMOCD) rules and regulations.
- Steel Tanks may be used in lieu of reserve pits where conditions prevent reserve pit construction such as shallow soils over solid rock where blasting is required and the operator does not want to perform blasting, or for other reasons such as a shallow groundwater table.
- Where possible, surface and buried pipelines should parallel existing roads.
- Clearing vegetation for pipelines, electric lines, and utilities should be kept to a minimum. In some locations, only trenching may be necessary.
- Reclaim any disturbed areas outside the radius of the guy line anchors and/or any land not necessary for well operations using the methods detailed in well abandonment for post well completion and intermediate reclamation.
- Road surface material removal.

- Road surface material burial on location.

- Returning the removed caliche (surface material) to mineral material pits and/or reusing and applying the removed caliche (surfacing material) to other roads and pads.

- Ripping of compacted soil surfaces to a depth determined by depth of soil shown in the Soil Conservation Service Survey Handbooks.

- Contouring

- Removing structures, such as production facilities, meters, power poles, and power lines, when they are longer in use.

- Utilizing berms, fences, or contoured moguls to control access

- Erosion control practices such as waterbars, terracing, ripping against contour, matting, mulching

- Application of fertilizer (chemical and organic)

- Application of mulch and or hydromulching

- Watering or irrigation of seeded areas

- Fencing around the reclaimed areas of the well pad which may be based on known distances to watering sources for cattle.

- BLM shall discuss reclamation requirements with the holder prior to starting reclamation (onsite meetings are encouraged). The BLM would notify the grazing permittee of the time for the onsite meeting, which would allow the grazing permittee the opportunity to participate.

- Dispose of hazardous and other refuse in a timely and appropriate manner.

The frequency of authorized seismic exploration would be dependent upon resource conditions and seasonal restrictions (timing limitations) that may be imposed to reduce conflicts with watershed conditions, wildlife, and hunting. Management practices specific to wildlife and vegetation resources include the following:

- Prior to surveying/flagging routes for geophysical surveys or other preliminary activities during the raptor-breeding season, the project area shall be surveyed for raptor nests.
- Surveys when necessary would be conducted by personnel approved by the BLM

- The Universal Transmercator grid (UTM) locations of all raptor nests would be reported to the Authorized Officer. All active raptor nests would be avoided by the required distances described under the Well Sites section of the Appendix. An “active raptor nest” is defined as any raptor, including burrowing owls, or corvid nest being occupied during the current nesting season.

- During operations at any time, large (greater than 6 feet in height) trees or shrubs containing or capable of containing a raptor nest would be avoided by vehicular traffic or other activities likely to destroy them.

- Geophysical exploration operations, drilling for oil and gas, and other development would not be allowed in special status species habitat during the period of March 1 through June 30, each year.

- Activities would be planned to avoid wet periods.

- Geophysical operations would minimize the off-road impact of large vehicles. Use wide, flat-tread, balloon tires (especially on seismic thumper trucks) where possible. Use all-terrain vehicles

rather than large vehicles where possible.

- Occupied habitat for special status species would be avoided in a manner similar to surface use requirements (see Chapter 2 Management Common to All Alternatives).

Measuring Reclamation Success

The BLM revegetation goal is to approach or match the vegetation composition of the undisturbed surrounding area. Reclamation (efforts and success) would meet the satisfaction of the Authorized officer before the operator would be released from reclamation responsibilities. The Pecos District Office would use the Desired Plant Communities (DPC) as described in the Roswell RMP and the Carlsbad RMP for determining seed mixtures. The DPC also include a range of plants by percent composition that would be used to determine satisfactory reclamation. Pelletized seeds may be used. The Pecos District Office acknowledges some amount of subjectivity regarding successful reclamation. The Pecos District Office, however, would include scientifically acceptable sampling methods, such as pace transects, when making decisions quantifying reclamation success.

NOTE: The above BMPs are not all inclusive. Circumstances may dictate other requirements as deemed necessary by the Authorized Officer.

STANDARD OPERATING PROCEDURES

BMPs are built upon operating procedures that have become the norm through time, legislation and regulation. In an area such as southeast New Mexico with a long history of oil and gas development, the petroleum industry and the agencies charged with regulating that industry are familiar with those procedures. The following is a description of the standard operating procedures as they relate to reclamation and oil and gas development.

Administrative Requirements

The operator and its contractors and subcontractors will conduct all operations in full compliance with all applicable Federal, State, and local laws and regulations; applicable lease stipulations; and guidelines specified in the APD unless a written modification, waiver, or exception from the Authorized Officer has been granted. A copy of the approved APD along with any conditions of approval (*e.g.*, Lesser Prairie-chicken timing stipulation) shall be available at the drill site whenever active construction, drilling, or completion operations are under way.

Prior to commencing construction activities, the operator and its contractors and subcontractors may conduct a preconstruction conference with the BLM Authorized Officer. It is the responsibility of the operator to insure environmental and safety training is conducted with their contractors and subcontractors prior to construction. All employees would be familiarized with the resource protection policies of the BLM, requirements, and mitigating measures incorporated into each project.

The Authorized Officer approves the project during all stages of the project including construction of roads and well pad, drilling and completion of the well, reclamation, preparation for production, and abandonment.

Surface Use

Roads and Access Ways

The BLM requires the use of existing roads to the maximum extent practical and minimizing new roads in unroaded areas. If existing roads are used or damaged they would be maintained at the appropriate level by the responsible parties. Where new

roads are needed, construction, maintenance, rehabilitation, abandonment, and closure of the roads on public land would be in accordance with the BLM Authorized Officer's prescription at the time of abandonment and reclamation. Two different types of roads are described below for the Planning Area.

Permanent Roads

Design Specifications

- Travel width is normally 14 feet unless the Authorized Officer approves a different width. The maximum width of surface disturbance shall not exceed 30 feet. The permanent surfaced road will be constructed to have a travel way width which creates the smallest possible surface disturbance.
- Surfacing with an appropriate amount of gravel should be required where all weather access is needed.

Non-Surfaced Roads

- *Road travel way width* - A nonsurfaced access road would have a travel way which creates the smallest possible surface disturbance and would not exceed 14 feet in width.
- *Non-surfacing* - Surfacing material would not be required on the new access road travel way. The Holder would have the option to surface portions or the entirety of the access road if the Holder considers it necessary. Should the Holder elect to surface the access road, the Holder would submit a Sundry Notices And Reports On Wells requesting approval for a change in the conditions of approval to surface the access road. The Holder would obtain written approval from the Authorized Officer prior to surfacing. The surfacing material, depth and type, would be determined at the time of approval.
- No drive-arounds with the exception of turnouts, are allowed outside the travel way.
- The Authorized Officer would reserve the right to require surfacing of the access road at any time if deemed necessary. Surfacing may be required in the event the road deteriorates, erodes, road traffic increases, or it is determined to be beneficial for future field development. The surfacing depth and type of material would be determined at the time of notification.
- If the new access road is not surfaced, no improvements shall be made on the access road other than to remove vegetation as necessary, road irregularities, safety issues, or to fill low areas that may sustain standing water.
- Crowning and ditching would not be required on non-surfaced roads.
- The holder will be required to perform maintenance of the non-surfaced road if the road is negatively affected by inclement weather.

Well Sites

In siting facilities at the well site, the following measures must be followed:

- Disturbance would be minimized to existing fences and other improvements on public land.
- Residences, livestock facilities, and wildlife water supplies would be avoided within up to 200 meters.
- The construction of fence exclosures or barriers would be considered in crucial or critical habitat for Federal threatened and endangered, Federal candidate, or state-listed wildlife and plant species to protect all or portions of occupied habitat, specific populations, or to provide for scientific research on a species and its habitat. Fenced exclosures would also be considered to protect special habitat features such as wildlife waters, springs, significant lesser prairie-chicken booming grounds, or to provide for scientific research on a species and its habitat. The intent of using fences in this manner is to protect small areas, as opposed to fencing-out large areas of public lands. It is

expected that exclosures or barriers, if used, would be small in size and associated with specific sites.

- Surface disturbance would not be allowed within up to 200 meters of active raptor nests, including burrowing owls, on special, natural habitat features, such as trees, large brush, cliff faces and escarpments.
- Surface disturbance would not be allowed within up to 200 meters of playas and alkali lakes.
- Prior to surveying/flagging locations for pads, routes for roads, and other preliminary activities, during the raptor-breeding season, the project area will be surveyed for raptor nests. Surveys will be conducted by professional biologists or personnel approved by the BLM. All active raptor nests will be avoided during the dates and by the distances listed below. An active raptor nest is defined as any raptor or corvid nest being used during the current nesting season including nesting sites utilized by burrowing owls.
- Power lines would be constructed to standards outlined in the most recent version of "Suggested Practices for Raptor Protection on Power Lines" published by the Edison Electric Institute/Raptor Research Foundation, unless otherwise agreed to by the Authorized Officer. The holder is responsible for demonstrating that power pole designs not meeting these standards are raptor safe. Such proof would be provided by a raptor expert approved by the Authorized Officer. The BLM reserves the right to require modifications or additions to power line structures constructed under this authorization, should they be necessary to ensure the safety of large perching birds. The modifications and/or additions would be made by the holder without liability or expense to the United States.
- Facilities would be sited to minimize in-channel excavation.
- Sites would be selected that provide topographic and vegetative screening when feasible.
- Well pads would not be located within drainages.
- Pits containing oil, other hydrocarbons, salt water, or any toxic substances would not be allowed in drainages.
- Fluid containers would be located on the upslope side of drilling pads whenever possible to facilitate early detection of leaks and spills.
- Reserve pits would be netted to exclude birds and bats.
- In constructing the site: Construction would conform to the approved well site and layout plan in the Surface Use Plan of Operations (SUPO).
- Tree and vegetation clearing would be limited to the minimum area required.
- Construction activities would be timed to avoid wet periods.
- All reserve pits would be constructed in 100 percent cut material.
- All reserve pits would be lined with approved materials.
- Reserve pits would not be breached, to facilitate drying.
- Reserve pits would be surrounded by a BLM-standard four-strand barbed-wire fence.
- Above ground structures would be painted to blend with the natural color of the landscape.

Pipeline Siting

- Location of pipeline routes would not be adjacent to live watercourses or in proximity to steep hillsides to the extent practical to minimize the risk of petroleum spills and silt from construction entering ephemeral streams and drainages.
- Pipelines would be located along, but not in existing linear facilities (other pipelines and roads) to the maximum extent practical. Minimize pipeline crossing of undisturbed areas.

- Uprooted vegetation, soil, and rocks left as a result of construction or maintenance activity would be randomly scattered over the project area and

would not be left in rows, piles, or berms, unless otherwise approved by the Authorized Officer, except that an earthen berm would be left over the ditch line to allow for settling back to grade.

Surfacing Material Source

- The caliche/gravel pit would be constructed so that runoff and sediment does not drain into ephemeral streams and drainages. This may require the installation of sediment traps or barriers (slash or straw bales) to ensure that runoff is adequately filtered.
- During reclamation, the caliche/gravel pit would be regraded to closely match preconstruction conditions and revegetated.

Noxious Weed Control

- The BLM would determine the size and density of the noxious weed infestations requiring implementation of a control program.
- Mechanical, chemical, biological, or other methods approved by the BLM would be used to control infestations of noxious weed in disturbed areas.
- The operator would include provisions for noxious weed prevention and treatment in the SUPO. These may include removal of weed sources that could be picked up and transported by passing vehicles.

Pollution Control and Hazardous Substances Management

- Leaking equipment would be promptly repaired or removed from the site to prevent contamination from spills. Any soil or water that has been contaminated would be placed in appropriate containers and removed from the site. Disposal of vehicle fluids on public land would not be authorized.
- Copies of spill prevention, control, and countermeasure plans are required, and would be provided to the Authorized Officer.
- Use of pesticides and herbicides would comply with applicable Federal and State laws. Prior to use of pesticides, the BLM authorized officer would approve a plan for its use.
- Storage tanks would have a berm constructed around them, of sufficient dimensions to contain the contents of the largest tank, to serve as secondary containment should a spill occur.
- The concentration of hazardous substances in the reserve pit at the time of pit backfilling would not exceed the standards set forth in the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA).
- All drilling-related CERCLA hazardous substances removed from the location and not reused at another drilling location would be disposed of in accordance with applicable Federal and State regulations.
- All pits and tanks containing liquids or semi-liquids would be covered to prevent the entrapment or contamination of wildlife.

Drilling Operations

All proposed drilling operations and related surface-disturbing activities, as well as any change from an approved APD, would be approved before such activities are conducted. Approval occurs in accordance with (1) appropriate Onshore Oil and Gas Orders, (2) 43 CFR 3160, (3) Notices to Lessees, and (4) lease terms and conditions of approval.

Producing Operations

Portable and temporary facilities located on the drill pad are used to initiate the production from the reservoir. As drilling proceeds and reservoir limits are established, permanent production facilities

are designed and installed. The type, size, and number of the facilities are determined by the number of producing wells, expected production rates, volumes of gas and water expected to be produced with the oil, and the number of separate leases involved. Any construction of new, permanent production facilities would conform to the best management practices described above and also must comply with the regulations (CFR), onshore orders, and applicable Notices to Lessees.

Additional considerations may arise from power systems that may be required for pumping (gas or electric) and generate noise; the siting and operation of facilities to separate water from oil, treatment and storage facilities; and the need to dispose of wastewater that may be saline via evaporation pits or fluid injection.

Fluid minerals operations are subject to the applicable laws, regulations, lease terms and stipulations, orders, notices, and instructions of the BLM Authorized Officer. These include, but are not limited to, conducting operations in a manner that ensures the proper handling, measurement, disposition, and site security of leasehold production; and protecting other natural resources (including groundwater and other mineral deposits, i.e. potash, coal), environmental quality, life, and property:

- All production equipment installed on Federal leases would be constructed to prevent birds and bats from entering them and, to the extent practical, to discourage perching and nesting.
- All unused portions of the drill pad (which are the disturbed areas no longer needed for production operations, would be reclaimed.

<u>Abandonment and Reclamation (Well Pads and Roads)</u>

A reclamation plan would be part of the SUPO. Additional reclamation measures may be required based on the conditions existing at the time of abandonment, and included as part of the conditions of approval of the Notice of Intent to Abandon.

- All materials and equipment used in reclamation would be free of noxious weed seeds.
- The areas disturbed would be recontoured to the original contour or a contour which blends with the surrounding topography and minimizes erosion. The soil would be free of contaminants and would have adequate depth to provide for successful vegetation reclamation.
- Reestablishment of vegetation activities would be initiated prior to or during the next growing season after abandonment.
- Additional agronomic practices such as imprinting, mulching and irrigation would be required until reclamation is successful for areas where natural rainfall or other characteristics such as soil depth and structure are expected to limit seedling establishment.
- Vegetation reclamation would be considered successful when healthy, mature perennials are established with a composition and density that closely approximates the surrounding native vegetation as prescribed by the BLM, and the reclamation area is free of noxious weeds.
- The SUPO would include a restoration plan for habitat of special status species when the BLM determines it is appropriate. The restoration plan would be developed in consultation with the BLM and approved by the BLM. The NM BLM guidance is that affected parties and the grazing permittee would be invited when developing abandonment procedures.

RESOURCES:

- Soil Conservation Service Survey Handbook

- Best Management Practices (BMPs) for Oil and Gas Development on Public Lands- http://www.blm.gov/nhp/300/wo310/O&G/Ops/operations.html http://www.blm.gov/bmp/index.htm

- New Mexico Oil Conservation Division - http://www.emnrd.state.nm.us/ocd/
- http://www.emnrd.state.nm.us/OCD/Bureaus/Environmental/PIT/PITandBelowGradeTankGuidelines.pdf

- Carlsbad Approved Resource Management Plan Amendment and Record of Decision, October 1997

- Roswell Approved Resource Management Plan and Record of Decision, 1997

Appendix 6



APPENDIX 6
MONITORING AND IMPLEMENTATION

LANDS AND REALTY AND MINERALS

The Pecos District will develop maps that display the land use conflicts within the Planning Area. These maps will be used to aid implementation decisions so that these decisions will be in conformance to land use plans.

In addition to monitoring measure described in the following sections of this appendix, oil and gas development is monitored by BLM personnel to ensure conformance with land use plans, lease stipulations, and conditions of approval for individual wells.

VEGETATION, LIVESTOCK GRAZING, AND STANDARDS FOR PUBLIC LAND HEALTH

Monitoring

Vegetation

Standard protocol for permanent Rangeland Monitoring Study plots will be followed. These study plots include a photo of the 9 square foot plot, photos of each of the three 100-pace transect lines, pace-point data for ground cover and vegetative composition, clip and weigh data for annual vegetative production, and a transect to measure utilization of both overall and key forage species. This data is used to determine trends in cover and composition and to determine a range condition rating. In addition, Robel Pole measurements will be conducted to assess habitat components for the lesser prairie-chicken (see also Wildlife section).

A typical study plot consists of:

1. A 3-foot by 3-foot photo plot. This also serves as the starting point for the pace-point transects.

2. Three 100 pace-point transects. At each point (two steps) ground cover is recorded, either bare ground, litter, small rock (2 inches), large rock (2 inches), or basal hit on perennial plant. A basal hit on an annual plant is recorded as litter. If a basal hit is not recorded, the nearest perennial plant is also recorded. This gives percent ground cover and percent composition of vegetative component.

3. Three 10-plot clip and weight hoops. At every tenth pace, a hoop is dropped to one side of the transect line and current year's growth is clipped and weighed. This gives annual pounds of vegetative production.

4. One utilization transect. This determines the percent of annual production that has been utilized. Utilization is assessed using growth within a small cage as no use and is rated individually on several different key forage grasses as well as an overall reading on all grasses. Utilization classes include:

   - No use (0-5 percent) – Current year's seed stalks and leaves intact
   - Slight (6-20 percent) – Key forage species slightly used, current year's seed stalks little disturbed

- Light (21-40 percent) – Range appears skimmed or grazed in patches, 60-80 percent of current year's seed stalks intact
- Moderate (41-60 percent) – Range appears entirely covered, 15-25 percent of current year's seed stalks intact, no more than 10 percent of low forage plants used
- Heavy (61-80 percent) – Range has appearance of complete search, less than 10 percent of current year's seed stalks intact, more than 10 percent of low forage plants used
- Severe (81-100 percent) – Range has mown appearance, no evidence of current year's seed stalks, key plants completed used.

Within a 10-year period, each grazing allotment with studies is scheduled to have a "three line" year completed during three different years. At the end of this 10-year period, the data is summarized and any necessary adjustments to the grazing permit/lease are made. Changes in funding, staffing, or priorities could speed up or slow down this schedule.

For brush control treatments, a 100-foot canopy intercept transect is completed both the year before and the year following treatment. This gives a percent reduction in brush canopy and is used to assess the success of the treatment.

Standards for Public Land Health

There are different indicators that provide a measure of resource quality and functioning condition upon which the standards for public land health would be assessed. These indicators describe attributes of soil and site stability, watershed function, and biotic (plant and animal) integrity. The assessment process is a combination of qualitative and quantitative techniques that use observations and measurements made in the field to assign numeric values or rankings to each indicator. The indicators are rated relative to the degree of departure from what a healthy site would look like. For instance, if a healthy site is described as having no or few rills and the assessed site has few rills, then it is rated as none to slight departure. Conversely, if the assessed site has many rills, the site is rated as having severe departure. Once each of these indicators has been rated, these rankings are combined to determine soil and site stability, watershed function, and biotic integrity. Some indicators are used in all three of these categories, some in two of the three, and some in only one specific category. The Carlsbad Field Office uses 21 different indicators, while the Roswell Field Office uses 22 indicators.

The assessment process is based on the ecological site description and is done on a watershed basis. Both offices have schedules in place to determine the order in which each watershed area is assessed. The indicators are rated against the soil, vegetation, and animals described as typically present in that ecological site. During the rating process, site capability and current weather patterns are considered. Site capability is a measure of expected conditions such as degree of erosion or pounds per acre of vegetative production. If a site has been degraded over time, from whatever type of disturbance, it would be rated based on its current capacity. Similarly, if a site has experienced abnormal precipitation, either very dry or very wet, then these weather conditions would be factored into the indicator ratings.

The assessments are scheduled by watershed, with all assessments within one being completed before moving to

an adjoining watershed. Based on the current schedule, all allotments within the planning area should have an assessment completed by FY 2012. Changes in funding, staffing, or priorities could speed up or slow down this schedule.

Livestock Grazing

The methods described above under Vegetation are used to monitor effects of livestock grazing. In addition, grazing permittees/lessees submit actual use records for each grazing year. The data can be used to determine a carrying capacity in three ways, from the amount of annual forage production, from the amount of AUMs available based on range condition, and from actual use versus utilization.

Within a 10-year period, each grazing allotment with studies is scheduled to have a "three line" year completed during three different years. At the end of this 10-year period, the data is summarized and any necessary adjustments to the grazing permit/lease are made. Generally, the monitoring schedule precedes the permit/lease expiration schedule, so monitoring data is summarized just prior to permit/lease expiration and necessary adjustments can be made as the permit/lease is renewed.

Implementation

Should monitoring indicate a change is necessary, it can be accomplished by vegetative treatment or by modifying the grazing permit/lease.

Vegetation

Changes to the vegetative community, whether by mechanical, chemical, or prescribed fire methods, are generally accomplished 2 years after data indicate a change is warranted. Project planning typically takes 2 years from start to finish, so if monitoring in Fiscal Year 2007 indicates chemical brush control is needed to achieve the desired plant community, then the treatment will occur in Fiscal Year 2009. As with monitoring schedules, funding, staffing, and changing priorities can speed up or slow down implementation.

Livestock Grazing

Changes in livestock grazing practices, be it adjusting the permit or modifying a grazing scheme, are put into place as soon as monitoring data indicates the change is needed. Generally, the third year of monitoring data is collected in the fall and winter prior to permit/lease expiration at the end of February, so if changes are necessary they can be included in the new permit/lease.

Standards for Public Land Health

By regulation, implementation of livestock grazing guidelines must occur as soon as practicable but not later than the start of the next grazing year after determining that existing grazing management practices or levels of use are significant factors in failing to achieve one or more Standards. Should an action other than livestock grazing be the significant factor in failing to achieve one or more Standards, then appropriate action will be taken.

Wildlife

A number of studies will be used to monitor the effectiveness of land use decisions and implementation of the plan. Monitoring studies will include the following.

Lesser Prairie-Chicken

Lek Surveys: Surveys of lesser prairie-chicken lek locations and level of activity will be surveyed during the primary

breeding months of March through May. Surveys will consist of a combination of counts of birds using selected lek sites and roadside surveys. Methods used for both survey techniques will follow established protocols and will be coordinated with other cooperating entities conducting surveys in the area. Additional systematic searches will be conducted to determine if leks or breeding activity is occurring in areas where leks are not known to occur. Surveys will also be conducted in the fall in an effort to document new lek sites and distribution of birds.

The lek counts are designed to track the number of birds using different lek sites and monitor movement of birds between adjacent lek sites over time. The survey routes will assist in obtaining trends in numbers of leks and distribution of leks over a fairly broad area. These studies will assist in monitoring the general trends in the breeding populations, documenting the distribution of breeding birds during the breeding season, determining key areas important to lesser prairie-chicken, monitoring effects of land use management on lesser prairie-chicken populations and distribution.

Robel Vegetation Studies: Residual vegetation will be measured prior to the lesser prairie-chicken breeding season using the Robel pole methodology (Robel, et al. 1970). Study sites are linked to areas with known lek sites and lesser prairie-chicken occurrence. If all lek sites are not surveyed each year, the Robel studies will be conducted near those sites that are surveyed in a given year. These studies will assess the height of cover that exists just prior to the breeding season. This will be an indicator of the availability of adequate cover for lesser prairie-chicken nesting and will be used as one measure in managing the level of grazing use in a given pasture.

Vegetation Trend and Utilization Studies: Tends in key vegetation species and level of vegetation utilized by grazing animal will be monitored in cooperation with the rangeland management program. These data will be important in assessing the status of vegetative conditions and level of use that is occurring by grazing animals.

These studies will be used to monitor such things as vegetative conditions, level of vegetation use, and trends in lesser prairie-chicken breeding numbers and distribution. These data will assist in managing activities that affect vegetation condition and lesser prairie-chicken distribution and numbers including grazing administration, locations or timing for rights-of-way or oil and gas development, and vegetation management decisions.

Sand Dune Lizard

Distribution Surveys and Monitoring: Sand dune lizard distribution will be determined through surveys using established scientific protocol. Continued presence of sand dune lizard in known locations will be monitored on a regular, scheduled basis. Surveys to determine or monitor presence of sand dune lizard will be important in determining where or how surface disturbing activities may be authorized. They will also assist in assessing the effectiveness of authorizations and mitigating measures in protecting sand dune lizard habitats and populations.

Habitat Surveys and Monitoring: The suitability of habitat, in conjunction with the location of suitable habitat, will be assessed throughout the range of the species in the Planning Area. The status of the suitability of the habitat will also be monitored over time. The criteria for suitability will be determined through consultation with recognized experts on the species. The habitat

surveys and monitoring studies will assist in documenting presence of the species and suitable habitats, assist in making land use decisions that minimize impacts to the species and its habitats, assist in assessing conservation opportunities, especially as it relates to maintaining dispersal corridors and connectivity, and serves as a vehicle for assessing effectiveness of mitigating measures and land use decisions.

Landscape Analyses: A landscape analysis approach will also be used to monitor both the lesser prairie-chicken and sand dune lizard. This will utilize geographic information systems (GIS) to display a variety of information important in assessing the status of these species and their habitats. Data would include, but not be limited to, distribution of lesser prairie-chicken and sand dune lizard, distribution of vegetation communities, changes in reclamation or disturbance in key habitats, and locations of activities such as roads, rights-of-way, and oil and gas developments. This information will assist in assessing factors important to the status of these species including connectivity of habitats, degree of fragmentation, and trends in habitat conditions and species distribution on a landscape scale.

Implementation

In addition to the monitoring of the habitat conditions for chickens and lizards, BLM participates in the New Mexico Lesser Prairie-Chicken/Sand Dune Lizard Implementation Team, an outgrowth of the Working Group's Conservation Strategy (Appendix 2). The Strategy and this RMPA are part of and adaptive management process. Any new species information, techniques, or reclamation/restoration methods would be incorporated into the best management practices (BMPs) included in this RMPA.

Population and habitat surveys through 2006 serve as a baseline data for this resource management plan amendment. This data includes the *Final Investigation Report: The Lesser Prairie-Chicken in New Mexico* (February 2006) from the New Mexico Department of Game and Fish.

Recreation and Off-Highway Vehicles

The Roswell Field Office has established fee areas in recreation areas, including OHV areas. Monitoring would be accomplished through Recreation Use Permits and volunteers who help maintain these areas and do visitor monitoring. Electronic monitoring devices like traffic counters are also used to monitor visits to the sites. Monitoring data is collected each month and is made a matter of record at the Roswell Field Office.

In the Carlsbad Field Office, monitoring would be accomplished through Recreation Use Permits and volunteers who help maintain these areas and do visitor monitoring. Electronic monitoring devices like traffic counters are also used to monitor visits to the sites. Monitoring data is collected each month and is made a matter of record at the Carlsbad Field Office.

Implementation of the expansion of existing OHV areas or establishing new OHV areas - unless the monitoring of visitor use demonstrates the public's need and monitoring indicates there would be no conflicts with lesser prairie-chicken and sand dune lizard habitat.

Power Line Removal Credit Program

In order to provide opportunities for expansion of lesser prairie-chicken habitat within the Planning Area, applicants for electric power lines could participate in power line removal credit (PLRC). Under this program applicants

would remove 1.5 miles of idle power lines (wire and poles) within lesser prairie-chicken habitat management unit (CMA, PPA, SSPA and IPA) and habitat type (occupied or suitable/potentially suitable) before receiving authorization to construct 1.0 miles of new power line.

The priority for removing idle power lines is, in order, Core Management Area, Primary Population Area, the Habitat Evaluation Areas, Sparse and Scattered Population Area, and Isolated Population Area. Within these management areas, the priority for removing idle power lines is, in order, occupied, and suitable habitat. For purposes of this program potentially suitable habitat would be treated as suitable habitat. The PLRC program would not be applicable in unsuitable habitat, regardless of the management unit (CMA, PPA, SSPA and IPA).

Applicants would be able to substitute power line removal in higher priority areas for construction of new power lines in lower priority areas. For example, 3 miles of power lines removed in occupied habitat within the PPA would meet the requirements for constructing 2 miles of new power lines in suitable habitat within the PPA and lower priority management units. For an illustration of how the priorities would be applied and the credits allocated see the matrix below.

The Habitat Evaluation Areas are included in the matrix because of their importance as potential building blocks for the expansion of lesser prairie-chicken populations. The Habitat Evaluation Areas which have high potential for reclamation and as habitat for re-establishment of chicken populations would remain as depicted in the matrix below. Those Habitat Evaluation Areas determined to be lacking high conservation value would be managed according to the IPA prescriptions. Criteria for evaluating the Habitat Evaluation Areas can be found in Appendix 8.

Credits accrued by removing power lines (wire and poles) are not dependant on surface ownership. Credits accrued by removing power lines on either State or private surface can be used for new construction on BLM managed surface.

Idle power lines removed by an applicant can be counted or "banked" for future consideration providing the applicant reports the removal to BLM. Applicants may trade, buy or sell credits, providing the applicant reports transactions to BLM. BLM Carlsbad Field Office Realty Program would be the office of record for the PLRC.

<u>Implementing the PLRC</u>

Prior to applying for removal credits, participants would submit to BLM baseline data of overhead power lines within the Planning Area under their control. This data must be in a format compatible with BLM's Geographic Information System (GIS).

To apply for removal credits, a participant would:

- Submit to BLM data files compatible with BLM's GIS. These files would include
  - participant's name;
  - a unique identifying name or number (This is up to the power line participant. If the participant already has a system to identify power lines or segments, then by all means continue to use the system of identification.)
  - the location of line removed. (The linear distance and location of power lines removed are the key components of the information.)

- After verification, BLM would then overlay the data onto the Planning Area, calculate the linear distance of the removed power lines, and credit the removal to the appropriate management category (see the matrix below). BLM would then total the amount of removal be management category and communicate to the participant the amount of credits available for use.

- Participants participating in the Power Line Removal Credit program would by responsible for communicating to BLM the location and length of new construction within the Planning Area. Data files which include the information described above would be appropriate. BLM would debit the account and provide an accounting of remaining credits to the participant.

REMOVAL/NEW CONSTRUCTION MATRIX

Mgmt Unit	Occupied	Suitable
CMA	R	B
PPA	B	B
HEA	B	B
SSPA	B	B
IPA	B	B

Mgmt Unit	Occupied	Suitable
CMA	N	R
PPA	B	B
HEA	B	B
SSPA	B	B
IPA	B	B

Mgmt Unit	Occupied	Suitable
CMA	N	N
PPA	R	B
HEA	B	B
SSPA	B	B
IPA	B	B

Mgmt Unit	Occupied	Suitable
CMA	N	N
PPA	N	R
HEA	B	B
SSPA	B	B
IPA	B	B

Mgmt Unit	Occupied	Suitable
CMA	N	N
PPA	N	N
HEA	R	B
SSPA	B	B
IPA	B	B

Mgmt Unit	Occupied	Suitable
CMA	N	N
PPA	N	N
HEA	N	R
SSPA	B	B
IPA	B	B

Mgmt Unit	Occupied	Suitable
CMA	N	N
PPA	N	N
HEA	N	N
SSPA	R	B
IPA	B	B

Mgmt Unit	Occupied	Suitable
CMA	N	N
PPA	R	B
HEA	N	N
SSPA	N	R
IPA	B	B

Mgmt Unit	Occupied	Suitable
CMA	N	N
PPA	N	N
HEA	N	N
SSPA	N	N
IPA	R	B

Mgmt Unit	Occupied	Suitable
CMA	N	N
PPA	N	N
HEA	N	N
SSPA	N	N
IPA	N	R

NOTES: R = for every 1.5 miles of idle power lines Removed, 1.0 mile of new power lines could be built in the management unit; B = 1.0 miles of new power line construction could be Built in this management area, N = No credits available and no new power line construction would be authorized.

Implementing Exceptions, Modifications, and Waivers

The BLM Land Use Planning Handbook, H-1701-1, directs BLM to delineate the conditions under which an exception, modification or waiver would be granted to stipulations applied to oil and gas leases. Table AP6-1 delineates those conditions for the lease stipulations developed as a result of this resource management plan amendment. Decisions granting exceptions, modifications or waivers would be documented in an appropriate National Environmental Policy Act or environmental review document, which may include opportunities for public comment and participation.

TABLE AP6-1 EXCEPTIONS, MODIFICATIONS, AND WAIVERS

TYPE OF STIPULATION	PROTECTED RESOURCE	STIPULATION DESCRIPTION	EXCEPTIONS, MODIFICATIONS AND WAIVERS
No Surface Occupancy	Dune Complexes – Sand Dune Lizard Habitat	Stipulation: Dune Complexes. NSO has been applied to all or portions of the lease to prevent surface disturbance in the dune complexes. Purpose: To protect occupied and suitable sand dune lizard habitat.	EXCEPTION: The authorized officer may grant an exception to a portion of this stipulated area if an environmental analysis determines that the action, as proposed or conditioned, would not impair the function or utility of the dune complexes for occupied or suitable sand dune lizard habitat. MODIFICATION: The authorized officer may modify in extent if an evaluation finds that a portion of the NSO area is nonessential, or that the proposed action could be conditioned so as not to impair the function or utility of the dune complexes for occupied or suitable sand dune lizard habitat. WAIVER: This stipulation may be waived by the authorized officer, if after coordinating with the US Fish & Wildlife Service, it is determined that the site has been permanently abandoned or unoccupied; or, site conditions have changed such that there is no reasonable likelihood of site occupation.
Controlled Surface Use	Occupied Sand Dune Lizard Habitat	Stipulation: Sand Dune Lizard Survey. The lessee is required to conduct sand dune lizard occupancy surveys prior to submitting an application for permit to drill. Purpose: To identify occupied sand dune lizard habitat.	Exception: The authorized officer may grant an exception if an evaluation determines the site does not contain the characteristics of sand dune lizard habitat, or an third party not employed by the lessee has already conducted a BLM-approved survey of the site. Modification: The authorized officer may modify in extent if an evaluation finds that a portion of the lease does not contain the characteristics of sand dune lizard habitat, or an third party not employed by the lessee has already conducted a BLM-approved survey of that portion of the lease. Waiver: This stipulation may be waived by the authorized officer if, after coordinating with the US Fish & Wildlife Service, it is determined the entire lease no longer contains suitable sand dune lizard habitat.

Type of Stipulation	Protected Resource	Stipulation Description	Exceptions, Modifications and Waivers
Controlled Surface Use	Lesser Prairie-Chicken and Sand Dune Lizard Habitat	Stipulation: Plan of Development. Prior to submitting the first application for permit to drill, the lessee shall submit and obtain approval of a plan of development (POD) for the lease. The POD would disclose, to the fullest extent possible, all future well locations; the location and arrangement of well infrastructure (e.g., tank batteries, compressors, power lines and poles); road locations; and ROWs; and identify appropriate environmental best management practices to reduce the environmental effects on Lesser Prairie-Chicken and Sand Dune Lizard habitat. Purpose: To ensure the orderly development of the lease with a minimum of surface impacts in lesser prairie-chicken and sand dune lizard habitat	Exception: The authorized officer may grant an exception if an evaluation indicates the site does not contain habitat characteristics for either lesser prairie-chickens or sand dune lizards. Modification: The authorized officer may modify in extent if an evaluation finds that a portion of the lease does not contain the characteristics of either lesser prairie-chicken or sand dune lizard habitat. Waiver: This stipulation may be waived by the authorized officer if, after coordinating with the US Fish & Wildlife Service, it is determined the entire lease no longer contains characteristics of either lesser prairie-chicken or sand dune lizard habitat.

Appendix 7



APPENDIX 7
REVIEW OF THE
REASONABLE AND FORESEEABLE DEVELOPMENT

A Reasonable Foreseeable Development (RFD) is developed to forecast future activity and, in the case of oil and gas development, includes boom and bust cycles. The RFD does not imply any drilling restrictions or limitations but is simply a forecast of anticipated activity. The actual number of wells drilled per year varies from year-to-year. The accompanying tables and charts illustrate both the forecasted cycle as well as the actual cycle of activity in the oilfield. A review of the actual cycle of activity against what was forecast indicates the original RFD is still valid, and the actual activity level has not exceeded what was forecast.

A discussion of the geology of the Permian Basin and oil and gas activity of the general area is cited by reference (see Oil and gas in the New Mexico part of the Permian Basin, R.F. Broadhead and S.W. Speer, New Mexico Geological Society Guidebook, 44th Field Conference, Carlsbad Region, New Mexico and West Texas, 1993.)

In preparing the Special Status Species RMP Amendment/EIS, the original RFD, as it projects oil and gas development, needed to be reviewed. The original RFD can be found in Appendix 18 of the 1994 Draft Roswell RMP/Carlsbad RMPA.

The assumptions and guidelines for impact analysis for oil and gas development stated:

The RFD projections for the Carlsbad and Roswell Field Offices (Tables A18-1 and A18-2) in the 1994 Draft Roswell RMP/Carlsbad RMPA contain estimates of the number of wells drilled and the resulting acres of disturbance over a 20-year period.

The development of the RFD is based on the following assumptions and information.

1. Oil and gas activity would occur in accordance with continuing management guidance.

2. Oil and gas leasing laws and regulations would not change substantially over the next 20 years.

3. New leasing and/or development is based on RFD projections.

4. Based on historical drilling trends, there will be a "boom" period of increased drilling followed by a decrease in exploration and development, sometime in the life of the plan.

The RFD projections are based on an analysis of potential development. The following information was used in this analysis:

1. Areas available for leasing and development.

2. The potential for oil and gas occurrence (potential for occurrence does not imply or refer to the likelihood of development, extraction, or economic favorability).

3. Existing oil and gas practices.

4. Existing leases and related industry exploration and development activities.

Based on actual well counts by year, at least 47,811 wells have been drilled between the years 1904 and 1991 in southeastern New Mexico. The bulk of these wells were drilled after 1920.

The RFD projections are concerned with the total number of oil and gas wells, access roads, pipelines, and power lines projected to be developed during the next 20 years in the Pecos District. The RFD projection for the next 20 years represents projected disturbed acreage and well numbers including one "Boom-and Bust" cycle. The projected total number of wells was determined by using historical well data. Historical well data was obtained from New Mexico Oil Conservation Division (NMOCD) and BLM records. Total projected wells include wells from all categories of mineral estate ownership, unless otherwise indicated.

The RFD projections consist of Federal wells regardless of surface management or ownership. In determining the Federal portion of the RFD projections, percentages of wells by ownership category (i.e., Federal, State, fee) was used. The total number of wells forecast was multiplied by the percentage identified for Federal wells to obtain the projected number of Federal wells. Normal spacing for oil wells is 40 acres, 160 acres for shallow gas wells, and 320 acres for deep gas wells.

To provide a basis for the analysis of the cumulative impacts of oil & gas development and exploration, it is also necessary to review actions anticipated on private lands within the oil fields. Anticipated oil field development activities could affect federal acres within the developed oil fields. The following summation is an aggregate of disturbance resulting from activity on both Federal and private lands unless indicated otherwise. Many of the affected acres on private lands have already been disturbed by historic oil field operations.

Developmental wells average 503 oil, 203 gas, and 28 injection wells completed per year. Of these, an average of 382 oil, 162 gas and 21 injection wells are new completions.

During the 20-year analysis period, about 94 producing wells per year would be abandoned. This would result in the reclamation of about 1.5 of the 4.9 acres per well that are currently occupied by production facilities.

The following is a summary of wells drilled during the period of 1975-1992. This summary includes oil, gas, and plugged and abandoned (P&A) wells. These numbers include wells in all ownership categories (Federal, State, and fee) unless indicated otherwise.

In the Pecos District, there were 14,544 new well completions during the 18 years between 1975 and 1992 period. This is an average of 808 new well completions per year for the district. During this same period, 2,641 or 18 percent of these new well completions were plug and abandoned (P&A), an average of 147 P&A wells per year. Based on past-drilling history in the Roswell District, 39.5 percent of wells drilled were on Federal lands.

The RFD in Appendix 18 goes on to separate the Field Offices.

<u>Roswell Field Office</u>

In the Roswell Field Office, 3,318 of the wells drilled in the Pecos District were drilled as new well completions during the 18-year period, an average of 184 new well completions per year. During this same time frame, 951 or 29 percent of new well completions were P&A. This is an average of 53 P&A wells per year. Based on past drilling history in the Roswell Resource Area, 40 percent of wells drilled were on Federal land.

<u>Carlsbad Field Office</u>

In the Carlsbad Field Office, 11,226 wells were drilled as new well completions during the 1975-1992 period, for an average of 624

new well completions per year. During this same period, 1,688 or 15 percent of these new well completions were P&A, an average of 94 P&A wells per year. Based on past drilling history in the Carlsbad Field Office, 39 percent of wells drilled were on Federal land.

Based on the history of wells drilled in southeast New Mexico, The RFD projected an average of 319 federal wells to be drilled per year and an average of 58 wells per year to be P&A on Federal minerals. Those projected numbers for Roswell Field Office are 74 wells drilled per year and 21 wells P&A on Federal minerals. Those projected numbers for Carlsbad Field Office are 243 wells drilled per year and 37 P&A wells per year. The difference in the total of two wells drilled per year can be attributed to rounding differences.

To check the projected activity within the Pecos District, BLM collected well data from the New Mexico Oil Conservation Division (OCD). OCD records show that from 1993 to 2004 8,911 wells were drilled on all ownerships for an average of 743 wells per year. Within the Roswell Field Office 602 wells were drilled (50 wells per year) and 8,309 wells were drilled in the Carlsbad Field Office (692 wells per year). Federal wells during this period totaled 3,520 wells for an average of 293 wells per year within the District. Federal wells within Roswell Field Office totaled 240 wells for an average of 20 wells per year and the figures for Carlsbad Field Office are 3,240 wells total with an average of 270 wells per year. Over the past 12 years the average number of Federal wells drilled per year (290) is well within the projected annual average (319), therefore, the RFD projections are still valid.

The next task was to determine the amount of drilling activity within the Planning Area. Based on OCD actual well data and past RFD work, the Planning Area contains about 18 percent of all wells in the entire district. Using the 30-year average of all wells drilled in southeast New Mexico (782), we can estimate that approximately 141 wells will be drilled within the Planning Area. Using the average percentage of federal wells drilled per year (43 percent), it is estimated that of those 141 wells per year, 61 of them will be drilled for Federal minerals within the Planning Area. Based on the 30-year average percentage of federal wells drilled per year in the Roswell Field Office and Carlsbad Field Office, we can estimate that approximately 10 of the 61 wells will be drilled in the Roswell Field Office and 51 will be drilled in the Carlsbad Field Office per year.

Using the 30-year average of all wells plugged in southeast New Mexico (62), an estimated 11 wells will be plugged within the Planning Area. Using the average percentage of Federal wells plugged per year (43 percent), BLM can estimate that of those 11 wells plugged per year, 5 of them will be on Federal land, one in Roswell Field Office and 4 in Carlsbad Field Office.

Calculating the average number of wells drilled per year flattens the boom and bust cycles. As stated previously in this appendix, the RFD is a forecast of the future. This forecast is used in the analyses of impacts and is not used as a threshold for development scenarios. The forecast of 61 wells drilled per year in the Planning Area is expected to be exceeded in some years and not attained in others. The same is to be expected for the average number of wells per year to be plugged and abandoned.

TABLE AP7-1 PROJECTED OIL AND GAS WELLS						
	TOTAL WELLS	AVERAGE WELLS PER YEAR	PERCENTAGE OF WELLS IN THE PLANNING AREA	PLANNING AREA WELLS PER YEAR	PERCENTAGE OF FEDERAL WELLS	FEDERAL WELLS PER YEAR (RFO/CFO)
1975-1992	14,544	808	18	145	43	62 (10/52)
1993-2004	8,911	743	18	134	43	58 (9/49)
Total	23,455	782	18	141	43	61 (10/51)
SOURCE: Pecos District Office Files, 2006. NOTE: Data from New Mexico Oil Conservation Division						

Surface Disturbance from Oil and Gas Development

The assumptions for surface disturbance from access roads, drill pads, pipelines, power lines, and seismic activity were originally published in Appendix 18 of the Draft Roswell RMP/Carlsbad RMPA. Some of the values reflect values for exploration and development in new areas. Much of the Planning Area is within or near well-developed fields. Exploration and development of resources in well-developed areas reduces the distance required for roads, pipelines, and power lines. The surface disturbance assumptions were modified to estimate impacts associated with oil and gas exploration and development drilling activities in developed areas.

- Stabilization of surface disturbance is expected to occur within 3 years.

- Access Roads: 14 foot-wide travel way, 1.5 acres disturbance per access road, .75 acre disturbance stabilized per access road per well.

- Drill Pads: 1.4 acres disturbance per average well pad (250 feet x 250 feet), 1.0 acre stabilized per abandoned well.

- Pipelines: 1.6 acres initial disturbance per producing well (30 feet right-of-way width), .75 acres stabilized per producing well, 0.5 acres stabilized per abandoned producing well.

- Power lines: .5 acre initial disturbance per producing well, 0.25 acres stabilized per well.

- Statistics on drilling activity and surface disturbance assumptions were used to project acres of disturbance, stabilization, and net long-term disturbance for the planning area. Disturbance estimates are based on the most probable future projection of drilling activity on Federal land for the next 20 years.

- Approximately one acre is disturbed per mile of geophysical line. In the Roswell Field Office, approximately 150 miles of new geophysical lines are anticipated per year. In the Carlsbad Field Office, approximately 700 miles of new geophysical lines are anticipated per year. Reclamation of disturbance is expected to occur within 3 to 5 years.

- An average of 5 acres per well was used to determine surface disturbance in Chapter 4 discussions and are shown in Table AP7-5. This is a total acreage value and includes surface disturbance from roads, pipelines, power lines and other activities associated with exploration and development of oil and gas resources.

FEDERAL DRILLING ACTIVITY SINCE THE RFD WAS DEVELOPED FOR THE 1994 DRAFT RMP/RMPA/EIS

TABLE AP7 –2
ROSWELL FIELD OFFICE DRILLING ACTIVITY

YEAR	APDs RECEIVED	APDs APPROVED	ACTUAL WELLS DRILLED	RFD #'S
1992	N/A	N/A		
1993	36		12	35
1994	37		21	46
1995	28		11	38
1996	40		11	52
1997	43	22	26	64
1998	27	23	12	91
1999	27	23	10	161
2000	44	32	24	252
2001	61	56	31	132
2002	40	58	19	98
2003	67	65	45	76
2004	81	60	12	41
AVERAGE	**44**	**42**	**20**	**91**

SOURCE: Pecos District Office Files, 2006.
NOTE: Reasonable and foreseeable development projection

FIGURE AP7 -1 ROSWELL FIELD OFFICE DRILLING ACTIVITY

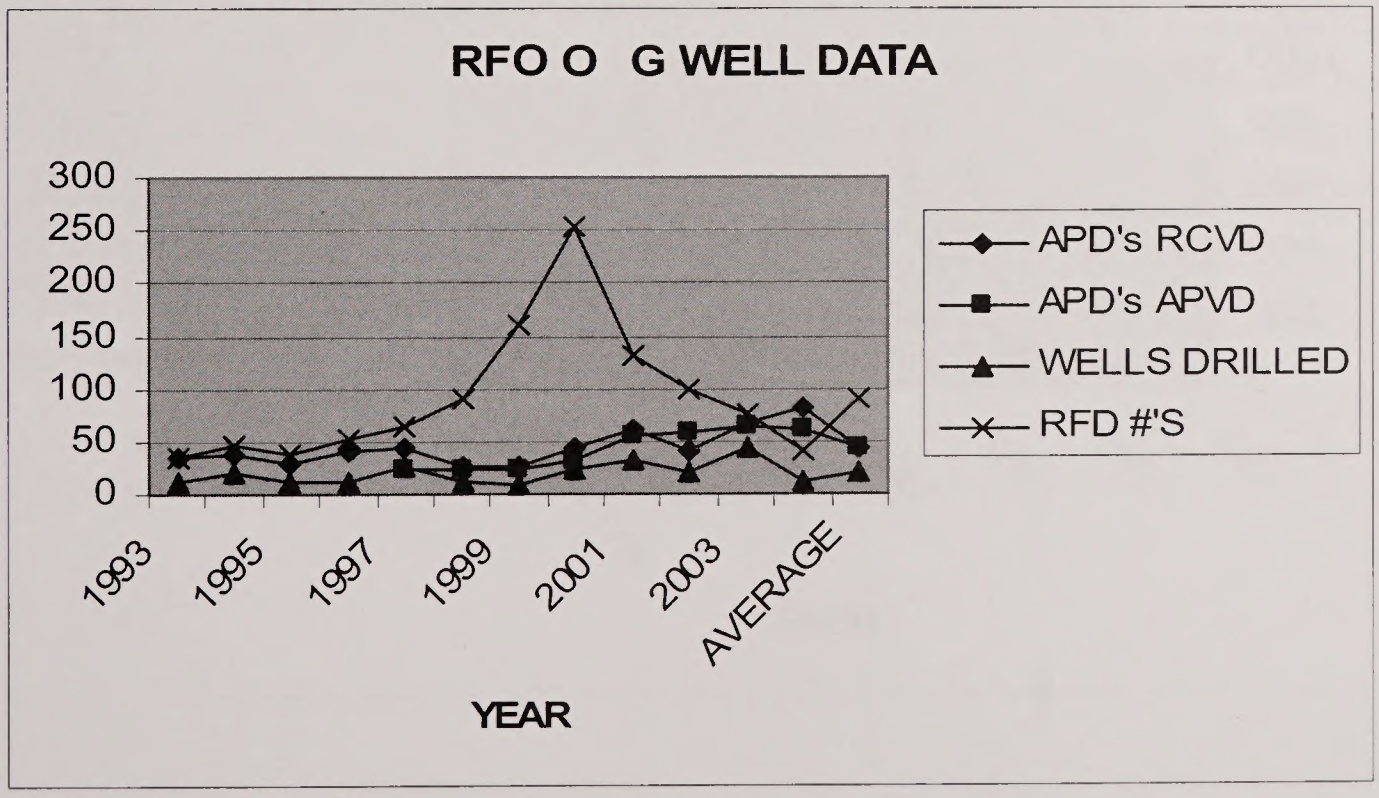


TABLE AP7-3 CARLSBAD FIELD OFFICE DRILLING ACTIVITY				
YEAR	APDs RECEIVED	APDs APPROVED	ACTUAL WELLS DRILLED	RFD #S
1992				
1993	812		188	213
1994	675		383	194
1995	600		391	228
1996	753		547	243
1997	773	512	503	254
1998	546	495	299	320
1999	363	327	215	337
2000	656	489	377	314
2001	592	564	364	267
2002	419	448	264	296
2003	577	557	353	322
2004	493	571	290	230
AVERAGE	605	495	348	268

SOURCE: Pecos District Office Files, 2006.

FIGURE 7-2 CARLSBAD FIELD OFFICE DRILLING ACTIVITY

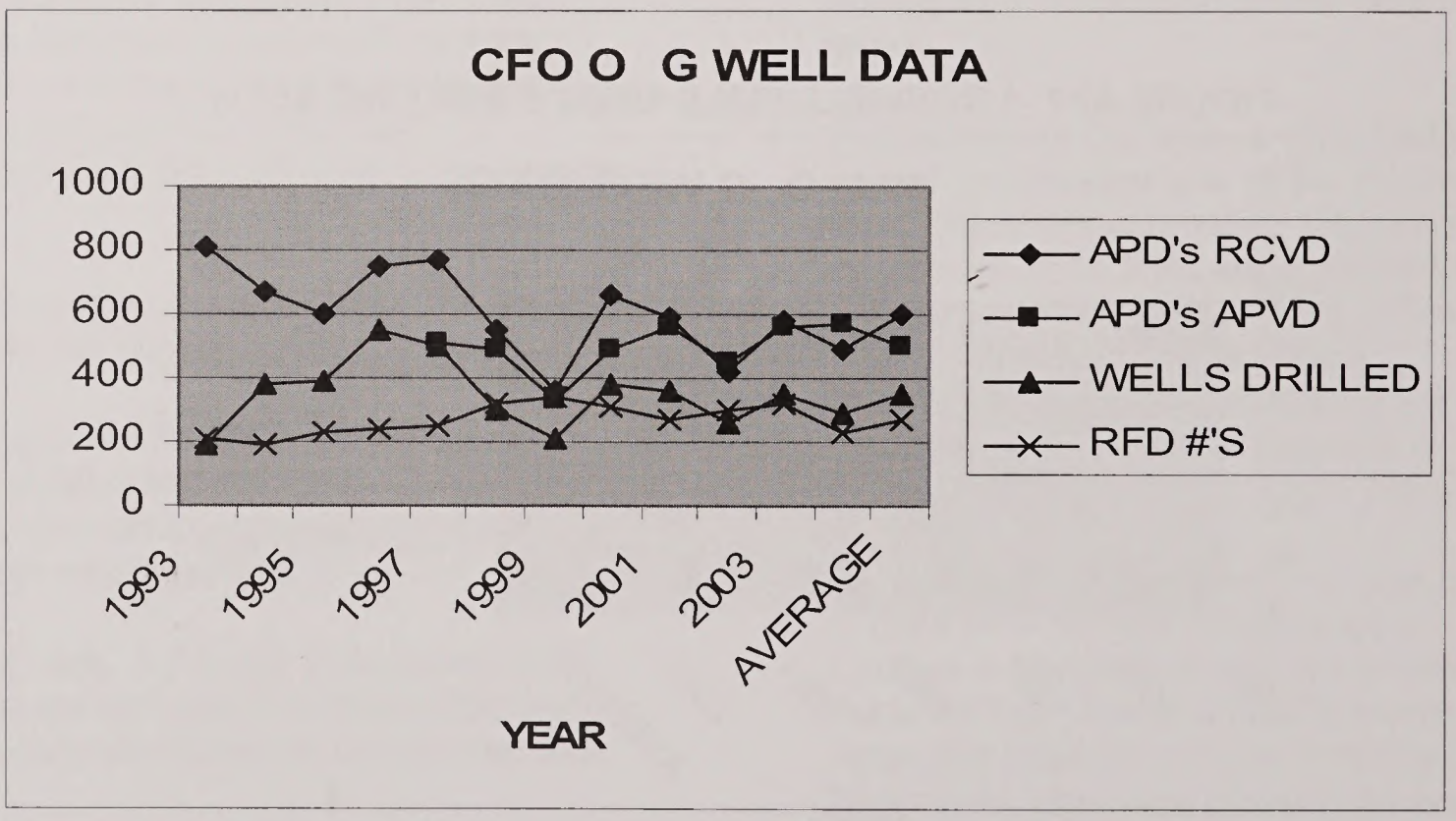


TABLE AP7-4 PECOS DISTRICT DRILLING ACTIVITY				
YEAR	APD's RECEIVED	APD's APPROVED	ACTUAL WELLS DRILLED	TOTAL RFD #'s
1992		N/A	N/A	N/A
1993	848	N/A	200	248
1994	712	N/A	404	240
1995	628	N/A	402	266
1996	793	N/A	558	295
1997	816	534	529	318
1998	573	518	311	411
1999	390	350	225	498
2000	700	521	401	566
2001	653	620	395	399
2002	459	506	283	394
2003	644	622	398	398
2004	574	631	302	271
AVERAGE	649	538	367	359

SOURCE: Pecos District Office Files, 2006.

FIGURE 7-3 PECOS DISTRICT DRILLING ACTIVITY

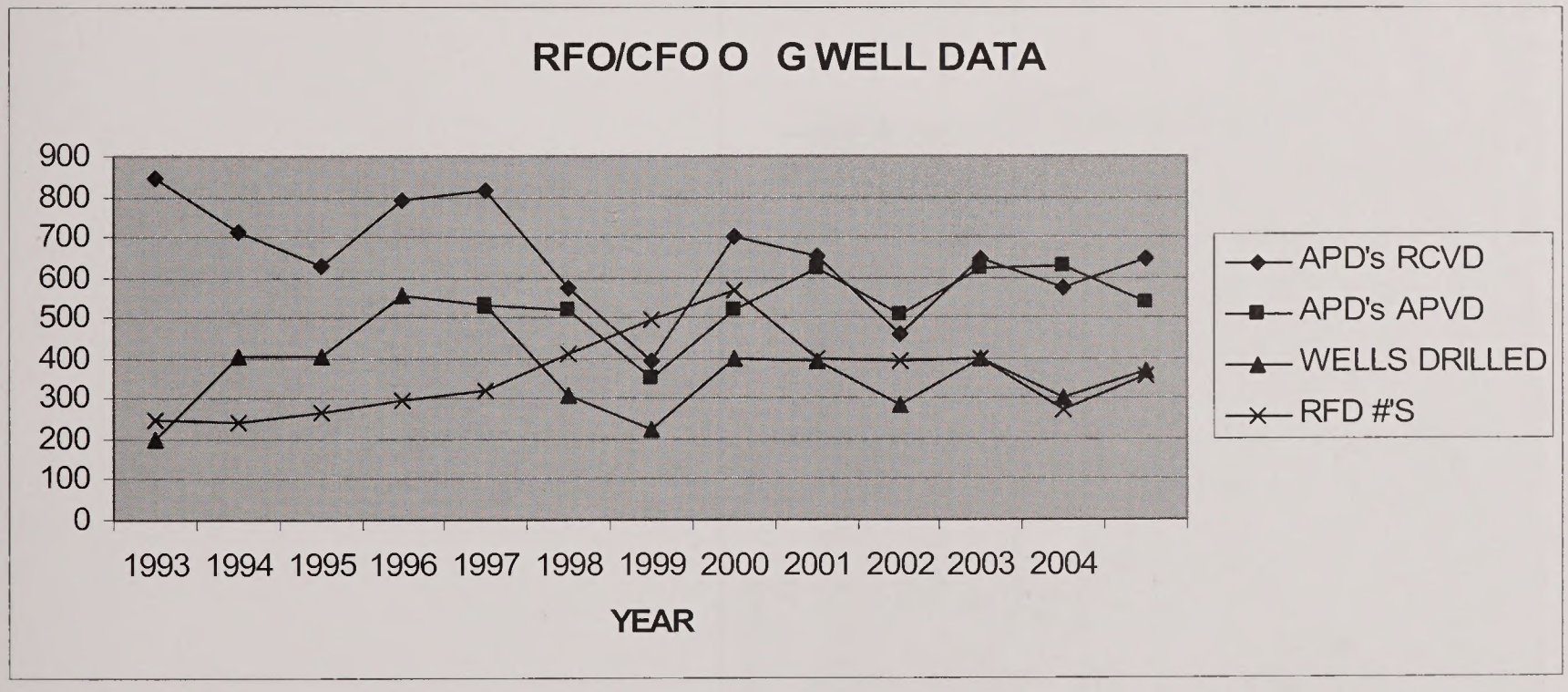


TABLE A7-5 SURFACE DISTURBANCE FROM OIL AND GAS DEVELOPMENT										
	ESTIMATED NUMBER OF WELLS DRILLED PER YEAR	ESTIMATED NUMBER OF WELLS PLUGGED AND ABANDONED PER YEAR	NUMBER OF ACRES DISTURBED PER YEAR	NUMBER OF ACRES RECLAIMED AND STABILIZED PER YEAR	NUMBER OF ACRES RECLAIMED FROM P A WELLS PER YEAR	ESTIMATED NUMBER OF WELLS DRILLED OVER 20 YEARS	ESTIMATED NUMBER OF WELLS PLUGGED AND ABANDONED OVER 20 YEARS	NUMBER OF ACRES DISTURBED OVER 20 YEARS	NUMBER OF ACRES RECLAIMED AND STABILIZED OVER 20 YEARS	NUMBER OF ACRES RECLAIMED FROM P A WELLS OVER 20 YEARS
No Action Alternative	61	11	305	140	18	1,220	220	6,100	2,806	360
Alternative A	51	11	255	117	18	1,020	220	5,100	2,346	360
Alternative B	49	11	245	113	18	980	220	4,900	2,254	360
Alternative C	49	11	245	113	18	980	220	4,900	2,254	360
Alternative D	54	11	270	124	18	1,080	220	5,400	2,484	360
Alternative E (5 years)	32	11	160	74	18	160	55	800	368	90

SOURCE: Pecos District Office Files, 2006.

Appendix 8



APPENDIX 8
HABITAT SUITABILITY CRITERIA
FOR LESSER PRAIRIE-CHICKEN HABITAT

The 17 Habitat Evaluation Areas are located in the Isolated Population Area (IPA). (See Alternatives A and B in Chapter 2, Map A-1 and Map B-1.) The Habitat Evaluation Areas were established to serve as potential habitat building blocks for expansion of the lesser prairie-chicken. This species is considered nearly extirpated in Lea and Eddy Counties and would be high priority for expanded surveys, habitat improvement, and reserve site establishment. In addition, any areas where lesser prairie-chicken populations face imminent threats of habitat conversion or fragmentation by development would be considered highest priority for strategies aimed at preventing habitat loss or minimizing developmental impacts.

The following criteria have been developed to determine habitat suitability and guide management strategies (primarily leasing) for the 17 Habitat Evaluation Areas identified in the Working Group Strategy (see Appendix B) and Alternatives A and B. This criterion was set forth for the following parameters in relation to the year-round habitat needs of the lesser prairie-chicken within the IPA. Habitat areas that contain 320 acres or more and contains 40 percent or more of suitable habitat (factoring in impact radii) would not be leased, or leased with a no surface occupancy stipulation. Leasing with the no surface occupancy requirement would mean there are acceptable drilling locations outside the lease that would not adversely impact lesser prairie-chicken habitat. Reclamation on adjacent areas should receive high priority due to the size and level of influence these blocks have on habitat connectivity.

If there is a presence of birds with the Habitat Evaluation Areas then the recommendation provided for the Isolated Population Area (IPA) in Alternatives A and B of this amendment would be implemented.

***Note**: Most of the Federal minerals have been leased within these habitat areas and are in some level of development. One assumption to be made is that once it is leased there is a likelihood of some level of development.*

CRITERIA:

1) Occupancy of lesser prairie-chicken- If there is evidence of LPC within the last three years and/or documented historic sightings.

2) Vegetation - Areas must be within the shinnery oak-dune plant community and provide the vegetative composition necessary for seasonal habitat requirements (i.e. nesting, brood rearing and winter thermal cover). If composition of vegetation is sufficient but may lack standing biomass then address those issues in coordination, consultation, and cooperation with the permittee.

3) Development and Fragmentation - The area being evaluated must contain a minimum "patch" size of 320 acres of Federal minerals that is not affected by fragmentation which is defined by impact radii. Studies in Kansas showed that lesser prairie-chickens seldom nest within 200 yards (.1 mile) of oil and gas well heads, 400 yards (.25 mile) of power lines, 860 yards (.5 mile) of improved roads, and 1370 yards (.75 mile) of large structures. Areas surrounding the "patch" (within 1 mile) may have some development but with a probability that reclamation will be

completed in the near future (within 1 to 5 years). The probability of reclamation depends upon the life of the wells or the field at the time of evaluation.

Data needed for evaluation:

- Presence or absence of lesser prairie-chickens (last 3 years)
- Percent vegetative composition (i.e., shrubs, grasses, forbs)
- Vegetative Condition (Range condition, Visual Obstruction readings, and production)
- Range site description
- Are there areas within the poly that are larger than 320 acres
- Estimate level of development (low, mid, high) within and adjacent to habitat polygon
- Evaluate the amount of Robel impact radii on suitable habitat (pads, roads, powerlines, compressors)
- Documented historic lekking activity (yes)

For areas to be considered Habitat Areas; the area needs to meet the occupancy criteria or the vegetation and development/fragmentation criteria or all three.

This criteria was designed for the 17 Habitat Evaluation Areas, but may be used in areas that have suitable habitat along with successful reclamation. When these criteria are used in areas other than the Isolated Population Area, the evaluator should take into account that other plant species may fulfill the role of shinnery-oak. This is particularly evident in the transition zone between the Chihuahuan Desert and the Southern Great Plains.

Appendix 9



APPENDIX 9
GRAZING ALLOTMENTS WITHIN THE PLANNING AREA

The following table lists the grazing allotments either partially or totally within the Planning Area boundary. Allotment numbers beginning with "6" are managed by the Roswell Field Office; those beginning with "7" are managed by the Carlsbad Field Office. Acreage totals exceed those listed in Chapter 1 for the Planning Area as this table reflects all acres within an allotment, while only a portion of the allotment may be in the Planning Area.

ALLOTMENT NUMBER	ALLOTMENT NAME	PUBLIC LAND ACRES	PERMITTED AUMS
61005	Jones Well	880	156
61006	Fritz Place	320	60
61007	Chaveroo	320	60
61008	Gallina Wells	2,831	504
65002	North Gambil Tank	380	72
65003	Bojax Ranch	200	40
65004	Hernandez Draw	3,240	768
65005	Bojax-South	6,222	1,200
65009	Chatten-Muncy	2,921	624
65010	Three Wells	2,478	516
65011	Salt Lake	1,933	516
65012	Barringer Tank	3,841	720
65013	Falsey Draw	1,924	384
65014	Abbott Well	2,050	528
65015	South Hanover Moon	160	12
65016	West Vest Lake	920	144
65017	Hanover Moon	320	60
65018	Cooper Well	3,858	584
65027	Lone Wolf	749	156
65029	Wilcox Wells	6,203	1,400
65030	Vest Lake	320	84
65031	Murdock Well	951	243
65032	Button Mesa	8,479	1,656
65033	Cato Field 3	220	48
65034	White Lakes-Crosby	16,814	3,527
65039	Palla Ranch	1,965	396
65043	Sand Ranch	27,112	4,592
65044	Twin Windmills	1,361	297
65045	Caprock Ranch	1,860	312
65048	Upper Caprock 3	679	144
65049	Sand Wells	5,268	840
65050	East Sand Tank	1,920	468
65051	West Mescalero Point	10,695	1,840
65053	Culp Ranch	31,406	4,992
65063	Shifting Sand 3	2,944	449

ALLOTMENT NUMBER	ALLOTMENT NAME	PUBLIC LAND ACRES	PERMITTED AUMS
65065	Under The Hill	6,124	1,042
65066	Old Spears Place	2,400	413
65073	Derrick Place	2,956	549
65074	Sand Camp Ranch	7,283	1,283
65075	Turkey Track	230,504	37,940
65077	Mescalero Ridge	18,828	2,978
65078	Caudill Ranch	5,792	967
65079	S and S	2,461	377
65085	Caprock West T	2,632	262
65090	South Caprock	3,137	567
65185	Caprock West M	1,773	256
65533	Cato Field 15	480	96
65547	Sand Ranch 15	90	12
65548	Upper Caprock 15	320	102
65563	Shifitng Sand 15	40	8
65566	Old Spears Place 15	120	24
65575	Turkey Track Sec. 15	40	2
76004	Sand Trap	1,740	278
76006	Pump Jack – South	16,760	2,304
76007	Maljamar South	12,448	1,452
76008	Querecho Plains	9,562	1,455
76009	Buckeye North	167	48
76010	Golf Course	480	88
76011	Laguna Tonto Unit	14,238	2,124
76011	Buckeye South Unit	20,014	3,461
76011	Salt Lake Unit	38,248	6,275
76012	Monument Draw	40	2
76013	Record	320	36
76014	White Breaks	260	40
76015	Nadine	1,560	72
76016	Jones City - North	807	75
76017	Eunice	840	236
76018	South Monument Draw	1,240	57
76019	Monument – SW	680	96
76020	Lea Townsite	15,426	3,495
76021	Halfway	14,346	3,617
76022	Laguna Toston	2,825	44
76023	Bilbry Basin	4,947	792
76024	Jones City	120	12
76026	Oil Center – South	1,120	127
76027	San Simon	13,597	1,900
76028	SWAG	11,327	1,805
76029	Playa Dunes	7,177	1,167
76030	Deep Wells	3,826	647
76033	East Rattlesnake	17,009	2,700
76034	Custer Mountain	850	96
76035	Medlin Wells	10,280	1,771

ALLOTMENT NUMBER	ALLOTMENT NAME	PUBLIC LAND ACRES	PERMITTED AUMS
76037	Red Tank	22,016	3,686
76038	Fairview	24,736	3,774
76039	Bobcat Draw	10,660	1,181
76040	Penn Tank	6700	883
76041	Old Baldy	569	84
76043	Javelina Basin	13,256	2,343
76047	Monument-Jal Oilfield	2,612	384
76048	San Simon Swale	5,830	1,524
76049	Hart Ranch	3,520	380
76051	Andrews Flat	13,184	2,040
76053	Ruth Ross Place	10,380	1,732
76056	Brookin West	160	24
76057	Jackson East	1,280	120
76058	Eddy 13	6,400	633
76061	Sand Dune	3,200	598
76104	Sand Trap II	640	84
76106	Pumpjack South II	323	48
76107	Majamar South II	320	24
76120	Lea Townsite – South	306	60
76128	SWAG II	1,280	84
76137	Red Tank II	2,760	348
77003	Taylor Peak	3,600	567
77004	Loco Hills	14,183	1,806
77007	Sand Hill	4,641	714
77008	Cedar Lake	14,622	1,427
77012	Twin Wells – North	82,406	11,664
77013	Clayton Basin	47,059	10,200
77021	West Bilbry	6,004	1,177
77022	Maroon Cliffs	16,245	2,120
77027	Livingston Ridge	38,106	6,483
77032	Antelope Ridge	66,757	9,576
77040	Phantom Banks	53,560	7,478
77042	Twin Wells	37,112	6,646
77043	Little Lake	4,800	691
TOTAL		**1,180,205**	**192,125**

Appendix 10



APPENDIX 10

Biological Assessment
And
U.S. Fish & Wildlife Service Response

United States Department of the Interior

BUREAU OF LAND MANAGEMENT

Pecos District Office
Roswell Field Office
2909 West Second Street
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IN REPLY REFER TO:
1610 (510)

September 25, 2006

Memorandum

To: Benjamin Tuggle, Regional Director, Region 2, U. S. Fish and Wildlife Service, Albuquerque, New Mexico

From: Doug Burger, District Manager, Pecos District, Bureau of Land Management

Subject: Biological Assessment for the Special Status Species Draft Resource Management Plan Amendment/Environmental Impact Statement (DRMPA/EIS)

On October 20, 2006, a notice of availability will be published in the *Federal Register* announcing the beginning of a 90-day public comment period for the Special Status Species Draft Resource Management Plan Amendment/Environmental Impact Statement (DRMPA/EIS). The Bureau of Land Management (BLM) Pecos District Office (Carlsbad and Roswell Field Offices) has prepared a biological assessment and requests for Section 7 consultation under the Endangered Species Act of 1973, as amended.

The Pecos District has prepared this biological assessment (BA) to analyze the potential effects of the Preferred Alternative as described in the Special Status Species DRMPA/EIS within Chaves, Eddy, Lea, and Roosevelt Counties. This BA addresses the Bureau of Land Management's actions and evaluates all listed, proposed, and candidate species potentially found within Chaves, Eddy, Lea, and Roosevelt Counties.

Specifically, the DRMPA/EIS analyzes proposed changes to the 1988 Carlsbad RMP, the 1997 Carlsbad RMPA, and the 1997 Roswell RMP. These proposed changes are designed to protect habitat for the lesser prairie-chicken (*Tympanuchus pallidicinctus*) and the sand dune lizard (*Sceloporus arenicolus*). Your office will receive a copy of the Special Status Species DRMPA/EIS in addition to this BA. We would appreciate a response by the close of the comment period which is scheduled to be January 18, 2007.

If you have questions about the BA or need clarification please contact Howard Parman, planning team leader, at 505-627-0212.

BIOLOGICAL ASSESSMENT

SPECIAL STATUS SPECIES PLAN AMENDMENT AND ENVIRONMENTAL IMPACT STATEMENT

United State Department of the Interior
Bureau of Land Management
Pecos District, New Mexico

September 25, 2006

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Introduction

The Bureau of Land Management (BLM) Pecos District Office (Carlsbad and Roswell Field Offices) has prepared this Biological Assessment (BA) to analyze the potential effects of the Preferred Alternative as described in the Special Status Species Plan Amendment and Environmental Impact Statement within Chaves, Eddy, Lea, and Roosevelt Counties. This BA addresses the Bureau of Land Management's management actions and evaluates all listed, proposed, and candidate species potentially found within Chaves, Eddy, Lea, and Roosevelt Counties.

Nineteen Federally-listed, proposed, and candidate species are known or have the potential to occur within Chaves, Eddy, Lea, and Roosevelt Counties (See Table 1). However, because of the land ownership patterns and the specific habitats used by these species, these animals/plants may occur within the broad borders of the counties, but not specifically on public lands within planning area. The potential for these species' presence, their habitats within the area, and any potential impacts on them resulting from implementation of Alternative B (Preferred Alternative) are examined in this document.

Description of the Preferred Alternative

The BLM Pecos District Office has prepared an Draft Environmental Impact Statement (DEIS) to address management prescriptions for the protection and enhancement of special status species and their habitat (particularly for the Lesser Prairie Chicken and Sand Dune Lizard) within Chaves, Eddy, Lea, and Roosevelt Counties (referred to as the Planning Area). However, protecting and enhancing habitat for these two species will also protect and enhance habitat for numerous other wildlife species throughout Southeast New Mexico. The objective of the Preferred Alternative is to modify existing uses (e.g., federal minerals development, livestock grazing, recreation-off highway vehicles, etc.) occurring on public lands to protect special status species while sustaining the local economy.

The Pecos District proposes to broaden the scope of this plan to an ecosystem level approach. An ecosystem approach offers the best opportunity to arrest the decline of biodiversity and eliminate or minimize the need for further listings. The Preferred Alternative and management decisions apply only to public lands and federal minerals. It is the main goal of the proposed action to protect and restore the health and productivity of the land in Shinnery Oak and Sand Dune Habitats that support two federal candidate wildlife species; the lesser prairie chicken and sand dune lizard.

Lands and Realty

The BLM would consider acquisition of lands in the Planning Area for special status species habitat when the opportunity arises from willing sellers as identified in the Lesser Prairie Chicken Working Group's Draft Conservation Strategy. There would be a priority on exchanges (surface and minerals) with the State Land Office within the Core Management Area. BLM has previously identified 22,000 acres of public land as suitable for disposal in Appendix 7 of the 1997 Roswell RMP. Criteria for acquisitions can be found in Appendix 5 of the 1997 Roswell RMP, and would be applied to potential acquisitions regardless of their location in the Planning Area.

TABLE 1

THREATENED ENDANGERED, PROPOSED CANDIDATE SPECIES

Species	Classification	Determination	County
Black Footed Ferret	Endangered	No Affect	All
Northern Aplomado Falcon	Endangered	No Affect	Chaves/Eddy/Lea
Interior Least Tern	Endangered	No Affect	Chaves/Eddy
Pecos Gambusia	Endangered	No Affect	Chaves/Eddy
Kuenzler's Hedgehog Cactus	Endangered	No Affect	Chaves/Eddy
Sneed Pincushion Cactus	Endangered	No Affect	Eddy
Koster's Springsnail	Proposed End.	No Affect	Chaves
Pecos Assiminea Snail	Proposed End.	No Affect	Chaves
Roswell Pyrg Springsnail	Proposed End.	No Affect	Chaves
Noel's Amphidpod	Proposed End.	No Affect	Chaves
Bald Eagle	Threatened	No Affect	All
Mexican Spotted Owl	Threatened	No Affect	Chaves/Eddy
Pecos Bluntnose Shiner	Threatened	No Affect	Chaves/Eddy
Pecos Sunflower	Threatened	No Affect	Chaves
Gypsum Wild-Buckwheat	Threatened	No Affect	Eddy
Lee Pincushion Cactus	Threatened	No Affect	Eddy
Lesser Prairie Chicken	Candidate	May Affect*	All
Sand Dune Lizard	Candidate	May Affect*	All
Texas Hornshell Mussel	Candidate	No Affect	Chaves/Eddy

* May Affect – Not Likely to Adversely Affect

Acquisition, in the public interest, would be acquired via exchange, purchase (of land and easements), and donation if they:

- Improve management of natural resources through consolidation of BLM, State, and other federal lands where agencies have compatible land management missions.

- Secure property necessary to protect special status species, promote biological diversity, enhance wildlife habitat, provide access to public waters and public lands, and preserve archaeological and historical resources.

Lands acquired as habitat for Special Status Species would be added to the right-of-way avoidance areas. Rights-of-way for projects and facilities such as fences, range and wildlife water pipelines, power distribution lines, access to oil and gas facilities, or oil and gas collection or distribution pipelines would be considered in avoidance zones on a case-by-case basis.

In order to provide opportunities for expansion of lesser prairie-chicken habitat within the Planning Area and to reduce the impacts of electric power lines, applicants for electric power lines would participate in a power line removal credit (PLRC). Under this program applicants would be required to remove 1.5 miles of idle power lines (wire and poles) within prairie-chicken habitat management unit (CMA, PPA, SSPA and IPA) and habitat type (occupied or suitable/potentially suitable) before receiving authorization to construct 1.0 mile of new power line. Appendix 6 of the DEIS, Monitoring and Implementation, contains the details of the implementation of the PLRC program.

BLM would consider granting exceptions to participation in the PLRC program on a case by case basis. Other mitigation measures that would be considered include, but are not limited to, those shown below. These mitigation measures are ranked in order of effectiveness of reducing impacts from power lines:

- Burying new distribution power lines within two miles of occupied lesser prairie-chicken habitat (measured from the lek) and in suitable lesser prairie-chicken habitat.
- Using internal combustion engines to power equipment at the well. Such engines would be muffled to 75 db measured at 30 feet from the source.
- Constructing new power lines in locations which avoid occupied and suitable lesser prairie-chicken habitat.
- In cases where overhead power lines already exist in occupied or suitable lesser prairie-chicken habitat, new power lines could be constructed immediately adjacent to an existing line but only to the extent of the existing overhead power lines. Where sections of the new power line cannot follow the existing line, it would have to be buried.
- Constructing all infrastructure supporting development of a well (including roads, power lines and pipelines) within the same corridor.

Within sand dune lizard habitat (See Map B-1 – in the DEIS), new surface disturbance in dune complexes would not be authorized. Exceptions to this requirement would be considered based on the proposed surface use and proposed mitigations indicating the proposal would not adversely affect the local sand dune lizard habitat.

The Core Management Area and occupied habitat within the Primary Population Area would be designated as right-of-way avoidance areas. The Mescalero Sands Area of Critical Environmental Concern (ACEC) and the Mathers research natural area would continue to be right-of-way exclusion areas. The Laguna Plata Archeological District, the Maroon Cliffs Archeological District, and the Mescalero Sands North Dune off highway vehicle area would continue to be right-of-way avoidance areas.

Minerals

Reasonable Foreseeable Development

Based on the Reasonable Foreseeable Development (RFD) for the Preferred Alternative, 49 wells (15-Gas and 34-Oil) are expected to be drilled within the Planning Area. These well would create 245 acres of direct disturbance on an annual basis (See Table 2), along with an indirect disturbance of approximately 6,174 acres annually. Over the lifetime of this plan (20-Year projection) there would be approximately 4,900 acres of direct disturbance and 123,480 acres of indirect disturbance. Based on the acreage within the Planning Area (1,852,946 acres), the total direct disturbance over the life of this plan would be less than ½ of one percent of the area.

In addition to disturbance from oil and gas development activities, there would be approximately 75 miles of geophysical activities occurring on an annual basis. This activity would create 75 acres of direct disturbance annually. Over the lifetime of this plan there would be approximately 1,500 acres of direct disturbance from geophysical activities.

Under an initial development scenario (single well pad with an access road, pipeline and powerline) there would be a direct disturbance of approximately 5 acres of habitat (1.4 acres-well pad, 1.5 acres-road, 1.6 acres-pipelines and .5 acre powerline). The noise and human activities would be constant for approximately 30-60 days of drilling causing an indirect disturbance to lesser prairie chicken and other wildlife species which would create an avoidance area (.25 mile radius - 126 acres) during the drilling phase. If the well is a non-producer and the site is abandoned and reclaimed, the lesser prairie chicken and other wildlife species would normally return to the area depending on the success of the reclamation of the site. However, re-vegetation of disturbed desert grasslands is typically very slow to recover (BLM 2001).

Table 2
Twenty-Year Projection of Impacts

Type of Action	Number of Actions on Federal Lands	Area Disturbed	Approximate Total Acres Disturbed	
			Short Term (3-Years)	Long Term
Geophysical (miles)	1,500	On existing roads and trails and off-road (1 acre/mile)	1,500	Minimal
Gas development wells	304	Drill pads, access road, pipelines, and power lines	836	684
Oil development wells	676	Drill pads, access road, pipelines, and power lines	1,859	1,521
Total Acres Disturbed by Drilling and Development Total Acres Disturbed by Geophysical Operations			2,695 1,500	2,205

If the well shows enough potential reserves to progress into a full field development the following impacts could occur. Full field development has a total complement of roads, pads, gravel sources and pipelines (16 well pads-40 acre spacing). The direct disturbance from this full field development would increase to approximately 85 acres (22.4 acres-well pads, 24 acres-roads, 25.6 acres-pipelines, 8 acres-powerlines and 5 acre gravel pit). The combination of the density of roads, pipelines, pads, and powerlines on the leasehold, would change the short-term disturbance of the one well scenario into an industrial complex. Because of the infrastructure, this site would be continuously occupied and a large zone of avoidance (.75 mile radius – 1,183 acres) would develop with most if not all wildlife species avoiding the area.

Seismic operations would be scattered out over most of the area during the twenty-year life of this plan and would average approximately 75 miles per year (1,500 miles over the 20-year life of the plan). However, the exact acreage would vary from year to year. The indirect

disturbance from seismic operations would be relatively short term, not extending beyond the 1 to 3 days required to complete each segment of the geophysical work.

The direct disturbance to soil and vegetation is considered minimal and there would be no anticipated changes in the animal community, habitat structure, or change in plant species composition or density within the seismic operation area.

Within the Planning Area, any habitat that is currently designated as unsuitable for lesser prairie-chicken or sand dune lizard, but has potential to become suitable, and ultimately occupied, would be closed to leasing or leased with requirements for Plans of Development (PODs) and/or Conditions of Approval (COAs) to ensure orderly development with a minimum of surface impacts to lesser prairie-chicken and sand dune lizard habitats. These PODs and COAs would contain various strategies for minimizing impacts associated with new development and for reclaiming previously disturbed areas. Methods to achieve this would include, but not be limited to; vegetative treatments, rehabilitation of pads, roads, and rights of way, and reduction of infrastructure needed to support the lease. These strategies would be designed to improve habitat, enhance connectivity, reduce fragmentation, and move towards Desired Plant Community (DPC). Plans of Development may contain proprietary information and such information is not subject to disclosure under the Freedom of Information Act.

Unitization may be required on new leases in the Planning Area to ensure protection of special status species habitat; as allowed by lease notices. Existing lessees would be encouraged to join these units.

Within the Planning Area, coordinated efforts to reclaim and restore habitat in previously disturbed areas would be carried out when and where opportunities arise. Priority locations are areas in and around lesser prairie-chicken reserves and other important habitat areas, and locations where restoration can help restore connectivity between isolated habitat blocks of BLM administered lands. Attempts would be made to reclaim three previously disturbed acres for every one acre of new disturbance.

Lesser Prairie Chicken

The Planning Area is divided into four categories: The Core Management Area, Primary Population Area, Sparse and Scattered Population Area, and the Isolated Population Area. Included in the Isolated Population Area are 17 Habitat Evaluation Areas. See Map B-1 in the DEIS for locations of these areas. Specific measures have been developed for each of the four categories to manage the oil and gas activities within lesser prairie chicken habitat.

Core Management Area (CMA) - The CMA would be expanded to include the existing Mescalero Sands Area of Critical Environmental Concern as one contiguous block. The CMA would be closed to new oil and gas leasing (See Table 3). Under certain limited exceptions, new oil and gas leasing may occur on a case-by-case basis; i.e., for pooling or drainage protection that does not impact suitable habitat. Within the CMA, no new mineral material sites will be authorized.

For existing leases, PODs and appropriate COAs would be required to ensure orderly development and would specify various strategies to reduce or eliminate impacts to special status species habitat. A POD would incorporate applicable best management practices (See Appendix 5 in the DEIS) and disclose all future well locations; the location and

arrangement of well infrastructure (e. g., tank batteries, compressors, power lines and poles); road locations; and rights-of-way.

Table 3
Acres of Leased and Unleased Federal Minerals

Management Area	Leased Federal Mineral	Unleased Federal Minerals
Core Management Area	43,338	128,299
Primary Population Area	105,641	93,157
Sparse & Scattered Population Area	78,414	51,781
Isolated Population Area	597,953	46,741
Totals	**825,346**	**319,977**

Primary Population Area (PPA) – Areas designated as occupied, suitable, potentially suitable and unsuitable habitat within the PPA are shown on Map B-5 in the DEIS.

Occupied and suitable lesser prairie-chicken habitat in the PPA would be closed to new oil and gas leasing (See Table 3). However, certain exceptions would be considered on a limited, case-by-case basis when indicated due to presence of existing infrastructure, or as needed for pooling or drainage protection purposes; and if leasing and subsequent development would not impact habitat. In these cases, a No Surface Occupancy (NSO) stipulation would be applied to the lease. Within the PPA, no new mineral material sites will be authorized in occupied or suitable lesser prairie-chicken habitat.

Areas designated as potentially suitable lesser prairie-chicken habitat would be available for new oil and gas leasing. If leasing and development in these areas would impact suitable habitat, then areas designated as potentially suitable habitat would be closed to new oil and gas leasing. Areas of potentially suitable habitat where lands can be used to "block up" larger surrounding areas of suitable habitat would also be closed to new leasing. Table 4 identifies the Robel impact distances in mapping and calculating the extent of habitat available to lesser prairie-chicken. These distances are used to evaluate impacts of potential projects and were applied to existing infrastructure as part of the definition of suitable and potentially suitable lesser prairie-chicken habitat.

Table 4
Robel Impact Distances

Oil or gas wellheads	.1 mile
Sand/dirt 2-track roads	0
Caliche roads, oil field access roads	.1 mile
Paved roads	.5 mile
Compressor stations	.75 mile
Houses	.5 mile
Power lines	.25 mile
Center-pivot fields	.25 mile

The BLM would consider new oil and gas leasing in occupied and suitable habitat throughout the Planning Area at such time the lesser prairie-chicken is no longer considered

for listing as a threatened and endangered species. At that time if new leases are offered, conditions would be attached to new leases that would preclude the lesser prairie-chicken returning to a Special Status Species.

New oil and gas leasing would be allowed in areas designated as unsuitable habitat subject to standard lease terms and appropriate timing and noise restrictions unless such habitat occurs inside the State Game Commission-owned Prairie-Chicken Area or where development would extend an impact/avoidance zone into suitable lesser prairie-chicken habitat. BLM would determine if habitat is suitable or unsuitable prior to issuing a new oil and gas lease.

Federal minerals within the State Game Commission-owned Prairie-Chicken Area (PCA) would be closed to new oil and gas leasing for the life of the plan amendment. However, new leasing within a PCA may be allowed with an NSO requirement, where this is determined to be appropriate, i.e., pooling or drainage protection that does not impact suitable habitat.

For existing leases, PODs and subsequent COAs would be required when requested. Included in PODs and COAs would be specifications for various strategies for minimizing impacts associated with new development and for reclaiming disturbed areas. A POD would incorporate applicable best management practices and disclose all future well locations; the location and arrangement of well infrastructure (e. g., tank batteries, compressors, power lines and poles); road locations; and rights-of-way.

Sparse and Scattered Population Area (SSPA) - Occupied lesser prairie-chicken habitat (within 1.5 miles from an active lek) would be closed to new leasing (See Table 3). New leasing with an NSO requirement may be allowed, where this is determined to be appropriate, i.e., pooling or drainage protection that does not impact suitable habitat. Within the SSPA, no mineral material sites will be authorized in occupied prairie-chicken habitat.

For existing leases, PODs and subsequent COAs would be required when requested. Included in PODs and COAs would be specifications for various strategies for minimizing impacts associated with new development and for reclaiming developed areas. A POD would incorporate applicable best management practices and disclose all future well locations; the location and arrangement of well infrastructure (e. g., tank batteries, compressors, power lines and poles); road locations; and rights-of-way.

Isolated Population Area (IPA) - Occupied lesser prairie-chicken habitat (within 1.5 miles from an active lek) would be closed to new leasing (See Table 3). New leasing with an NSO requirement may be allowed, where this is determined to be appropriate, i.e., pooling or drainage protection that does not impact suitable habitat. Within the IPA, no new mineral material sites will be authorized within 1.5 miles of an active lek.

For existing leases, PODs and subsequent COAs would be required in occupied, suitable and potentially suitable habitat. Included in PODs and COAs would be specifications for various strategies for minimizing impacts associated with new development and for reclaiming developed areas. A POD would incorporate applicable best management practices and disclose all future well locations; the location and arrangement of well infrastructure (e. g., tank batteries, compressors, power lines and poles); road locations; and rights-of-way.

Isolated Population Area (IPA) – Habitat Evaluation Areas (HEAs) - Habitat suitability analyses would be conducted in the 17 Habitat Evaluation Areas (See Map B-1 – in the DEIS). These areas would be prioritized for reclamation potential and for potential to re-established connectivity to adjacent isolated habitat blocks. Until the evaluation of an area is complete, new oil and gas leasing would be deferred. It may be determined, through the suitability analysis process, that these areas would be discretionarily closed to future oil and gas leasing. Criteria for closing these areas or making these areas available for lease can be found in Appendix 8. Areas determined to be lacking high conservation value would be managed according to the IPA prescriptions

Within the Planning Area timing (March 1st to June 15th, from the hours of 3:00 a.m. to 9:00 a.m.) and noise stipulations would be applied. Stipulations would be imposed in areas where the species habitat is present. These stipulations are intended to prevent disruption of mating and nesting by activities associated with energy exploration and development. Stipulations would be imposed in areas where the species habitat is present.

Exceptions to these requirements would be considered in emergency situations such as mechanical failures. These exceptions, however, would not be granted if BLM determines, on the basis of biological data or other relevant facts or circumstances, that the granting of an exception would disrupt prairie-chicken booming activity during the breeding season. Requests for exceptions on a non-emergency basis may also be considered, for the period of March 1st to June 15th, but these exceptions would not be granted if BLM determines that there is prairie-chicken habitat, prairie-chicken sightings, historic leks and or active leks within 1.5 miles of the proposed location, or any combination of the above mentioned criteria.

Exceptions to the Timing Stipulations/Conditions of Approval would not be granted in the following areas:

1. The CMA or PPA.

2. The IPA or SSPA within 1.5 miles of a lek that has been active for one out of the last 5 years.

3. The IPA or SSPA within 1.5 miles of sightings within the past 2 years. If lesser prairie chickens are not sighted by the end of the second year, exceptions would be considered for the area. However, if a new sighting occurs in the same area, the stipulations would be reapplied.

4. The 17 Habitat Evaluation Areas before and during the habitat evaluation process. Once the evaluation of the 17 Habitat Evaluation Areas is complete, the Habitat Evaluation Areas that do not meet the criteria for being an Habitat Evaluation Area would be considered for exceptions. Exceptions would continue to not be granted in the Habitat Evaluation Areas that do meet or exceed the criteria in Appendix 8.

5. Any new areas identified as Habitat Evaluation Areas that were not in the original 17 but meet or exceed the evaluation criteria.

If new lesser prairie chicken leks are discovered in the future within the Planning Area, the area around the lek would be considered occupied habitat and the prescriptions of this alternative would apply to proposed actions in and around that habitat.

Sand Dune Lizard

Tracts not currently under lease within Lizard Habitat Boundary (See Map B-1 – in the DEIS) would be closed to new oil and gas leasing until BLM determines that development of tracts nominated for leasing can be developed without impacting dune complexes. Depending on the results of that determination, the closure of a particular tract may continue, or it may be offered for lease with an NSO requirement or other appropriate stipulations.

If, after acquiring a federal mineral lease with an NSO stipulation, the lessee can demonstrate through the use and application of peer-reviewed science that development of the lease will not adversely impact dune complexes, waivers, exceptions, or modifications to the NSO stipulation may be considered if it is determined by the Authorized Officer that the stipulation is not required to protect habitat in the dune complexes. The nominated tract will be subject to the Pecos District land use plans in effect at the time of consideration. Granting of a waiver, exception or modification are discretionary actions which the operator should not routinely expect.

- WAIVER: a permanent exemption for a lease stipulation and the stipulation would no longer apply anywhere within the lease. In the case of NSO the Authorized Officer may waive the stipulation if no portion of the proposed lease is within occupied or suitable habitat and development of the lease will not adversely impact suitable or occupied special status species habitat.

- EXCEPTION: is a case-by-case exemption for a lease stipulation and the stipulation would continue to apply to all other sites within the lease. In the case of NSO the Authorized Officer may authorize surface occupancy if an environmental analysis finds the nature of the proposed action could be conditioned so as not to adversely impact suitable or occupied special status species habitat.

- MODIFICATION: a fundamental change in the provisions of a lease stipulation, either temporarily or for the term of the lease. In the case of NSO modifications may be granted by the Authorized Officer pending determination that a portion of the proposed lease is not within suitable or occupied habitat of special status species and development of the lease will not adversely impact suitable or occupied special status species habitat.

Waivers, exceptions or modifications will also be subject to other applicable regulatory and environmental compliance requirements. The BLM reserves the right to impose other stipulations in the same area of this leasehold if a waiver, exception or modification is granted.

For existing leases in sand dune lizard habitat (See Map B-1 – in the DEIS) surveys would be required prior to permitting surface disturbing activities and conducted by personnel approved by BLM. Depending on the results of the survey, proposed well sites may not be available to be developed and directional drilling may be necessary to develop all spacing units within a lease.

Surveys for occupied sand dune lizard habitat would follow scientific protocol. The best time period for sand dune lizard surveys is June 1 through September 30 between the hours of 9:00 a.m. and 5:00 p.m., while avoiding the heat of mid-day. Since surveys must be completed before any surface disturbing activities would be approved, lessees that do not complete surveys in the proper time frame would have to wait up to eight months before starting surveys.

Existing leases would require PODs which incorporate the results of the lizard surveys. The purpose of a POD is to assist the operator and BLM with planning for orderly development as a means to reduce or eliminate impacts to special status species habitat. A POD would also incorporate applicable best management practices and disclose all future well locations; the location and arrangement of well infrastructure (e. g., tank batteries, compressors, power lines and poles); road locations; and rights-of-way.

If new sand dune lizard occupied habitat is discovered in the future within the Planning Area, the prescriptions of this alternative would apply in and around that habitat.

Alternative Energy

There would be little or no opportunity for geothermal or biomass generation within the Planning Area. Therefore, these types of generating sites will not be considered.

The impacts of wind energy development and operation would be similar to those analyzed in the 2005 Wind Energy Programmatic EIS. Of the 13.4 million acres of public land within New Mexico, the EIS determined 9,800 acres were economically developable. None of these 9,800 is located within the Planning Area, therefore it is extremely unlikely that any wind generation would occur within the Planning Area.

Only commercial solar and wind generator sites would be considered in this plan amendment, however, wind and solar generation sites would be confined to areas that would have no negative impacts to occupied or suitable lesser prairie-chicken and sand dune lizard habitat.

Vegetation

The Desired Plant Community (DPC) concept of the Roswell Field Office, as described in Appendix 11 of the Roswell Resource Area Draft Resource Management Plan/Environmental Impact Statement (September 1994) and implemented by the 1997 Approved Roswell RMP, would be adopted in the Carlsbad Field Office portion of the Planning Area.

Ecological site descriptions, currently being modified by NRCS to include plant communities and transitional pathways, would be used to assess the Standards for Rangeland Health.

Rangeland restoration and vegetation treatments would continue to be implemented to improve or maintain the plant community needed to achieve multiple use management goals. These goals would address watershed management, wildlife habitat, and livestock needs. Brush encroachment from mesquite and catclaw would be a primary target to restore native grassland ecosystems with a focus on lesser prairie-chicken habitat types. Following treatment, a minimum of two growing seasons rest would be required. Following this recovery period, livestock grazing would be allowed if monitoring indicates progress towards meeting the vegetative standard.

Within the Planning Area, any habitat that is currently designated as unsuitable for lesser prairie-chicken or sand dune lizard, but has potential to become suitable, and ultimately occupied, would be identified and targeted for treatment. Methods to achieve this potential would include, but not be limited to, vegetative treatments, rehabilitation of pads, roads, and rights of way, and would be designed to improve habitat, enhance connectivity, reduce fragmentation, and move towards DPC. Not all areas designated as unsuitable habitat,

however, can be converted to suitable since the soils in some of these areas are not capable of producing the necessary vegetation for lesser prairie-chicken or sand dune lizard habitat.

Although mineral extraction may occur on a given piece of land over a period of many years, eventually resources become exhausted and wells and related infrastructure are taken out of production. In some areas this has already occurred; elsewhere, some wells are nearing maturity and may be plugged and abandoned within the next decade. This would create opportunities to increase suitable habitat, and to create or expand lesser prairie-chicken management areas. Recent pilot projects have focused on reclamation of abandoned well-pads and access roads, and re-contouring these sites with the surrounding landscape. Rangeland restoration efforts would target disturbed areas such as plugged/abandoned pads, roads, and rights-of-ways in lesser prairie-chicken habitat areas. Techniques to accomplish this restoration include removal of caliche, re-contouring, reseeding, fertilizer/water application if appropriate, and temporary fencing to allow establishment of vegetation. A combination of techniques could be utilized and would be site specific, depending on habitat requirements.

Mesquite encroachment into sand-shinnery and sand-sage ecosystems reduces the amount of forage and creates habitat that is unsuitable for lesser prairie-chicken nesting or brood-rearing. Mesquite control may be used to improve rangeland health in areas not used by lesser prairie-chickens, thereby reducing grazing pressure in nesting areas. This also could help offset forage losses due to initiation of conservative grazing on other ranch lands that are important lesser prairie-chicken habitat. Thus, mesquite control would be considered a valuable management tool. For Fiscal Year (FY) 2006, approximately 47,000 acres of land are scheduled for brush control treatments, of this, about 32,000 acres are on Public Lands. The primary target is mesquite, with some broom snakeweed targeted as well. The intent of these treatments is to move towards the attributes of DPC described above.

Shinnery oak treatments would follow guidelines described under alternative A, with one exception. The requirement that dispersal corridors of untreated shinnery oak flats at least 500 meters wide should be retained between suitable habitats, both occupied and unoccupied, that are separated by less than 200 meters would be dropped.

The standard practices that would be employed to meet management objectives in each community are:

- Utilization levels not exceeding 45 percent of annual plant production. Utilization levels would be determined prior to green-up and measured on key forage species.

- Projects such as fences, exclosures, water developments, erosion control structures, reseedings, or vegetative sales would be developed to allow continued livestock use while improving habitat requirements for both lesser prairie-chickens and sand dune lizards.

- Grazing treatments such as rest, changes in season of use, class of livestock, or stocking rates.
- Vegetation treatments, including, prescribed fire or prescribed natural fire, fuel wood sales, and biological, chemical or mechanical controls.

- Treatment of salt cedar as conditions warrant. Considerations in determining whether to treat include location and density of salt cedar stands, available budget and staff to conduct treatment, and objectives of proposed treatment.

- Native, deciduous tree species in all plant communities, such as hackberry, black walnut, New Mexico walnut, and desert willow, would be protected from vegetation treatments and surface disturbance.

Grassland Community

While this community has been broken up into several subtypes, the most common subtype within the Planning Area is the mesquite grassland. This subtype is found in the "sand country" east of the Pecos River and is characterized by level to gently rolling terrain, with dunes ranging from small stabilized hummocks to large active dunes. See Table 2-5 in the DEIS for vegetative community objectives for the grassland community.

Vegetation treatments to influence DPC would be considered at the following threshold levels:

- Mesquite 1/3 of the shrub cover composition
- Cholla 100 plants/acre
- Catclaw 5 percent vegetative cover
- Creosote 20% of the vegetative canopy
- Lechuguilla 20% of the vegetative canopy
- Tarbush 20% of the vegetative canopy
- Broom snakeweed 25% by weight of vegetative production
- Pinon/juniper 12 percent vegetative cover

Shinnery Oak-Dune Community

Treatments may be conducted to achieve DPC objectives in areas that are not considered suitable or occupied habitat for special status species (e.g., the sand dune lizard). Suitable and occupied habitat will not be chemically treated unless the species is removed from state or federal listing, or a chemical application rate is developed that would not impair habitat. See Table 2-6 in the DEIS for vegetative community objectives for the shinnery oak-dune community.

Vegetation treatments to influence DPC would be considered at the following threshold levels:

- Mesquite 1/3 of the shrub cover composition
- Shinnery Oak 40 percent of vegetative cover by composition

Mixed Desert Shrub Community

See Table 2-7 in the DEIS for vegetative community objectives for the mixed desert shrub community.

Vegetation treatments to influence DPC would be considered at the following threshold levels:

- Mesquite or Catclaw 1/3 of the shrub cover composition
- Cholla 100 plants/acre

- Creosote — 20% of the vegetative canopy
- Lechuguilla — 20% of the vegetative canopy
- Tarbush — 20% of the vegetative canopy
- Broom snakeweed — 25% by weight of vegetative production
- Pinon/juniper — 12 percent vegetative cover

Livestock Management

Under the Preferred Alternative, approximately 1.85 million acres, which includes about 850,000 acres of public land and makes up all or parts of 114 grazing allotments, would be available for livestock use. Currently, a total of 192,125 Animal Unit Months (AUMs) are permitted either by Grazing Permit or Grazing Lease. Actual use may vary due to adjustments of annual stocking rates and other management practices. These adjustments would be made based on monitoring data and through consultation, as discussed in 43 CFR 4100.

Since population numbers and habitat for the lesser prairie-chicken can be impacted by livestock grazing, management strategies would be implemented on allotments within the Planning Area. The strategies, based on monitoring data, include changing the time of year certain pastures are grazed, reducing/increasing allowable utilization levels, implementing pasture rotation schemes, and reducing/increasing the annual stocking rates on public land. Seasonal use restrictions would be applied, on a pasture basis, if monitoring indicates habitat requirements are not being met. An example would be removing livestock from a pasture during lesser prairie-chicken booming, and nesting seasons, then allowing livestock back into the pasture once this timeframe is past.

While the current grazing regulations (43 CFR 4100) provide flexibility and wide latitude to improve and maintain rangeland health, voluntary relinquishment would be one method to meet the goal of establishing habitat reserves for the lesser prairie-chicken within the Planning Area. Under this alternative, the decision to relinquish livestock grazing is totally voluntary on the part of the permittee/lessee. If a grazing permittee/lessee decides to voluntarily relinquish grazing on his/her allotment to resolve conflicts that exist between livestock grazing and protection of lesser prairie-chicken habitat, BLM would close the allotment to livestock grazing. This closure would continue for the life of this plan amendment and may or may not continue when the plan is revised. The criterion for BLM to accept a voluntary relinquishment and to close the allotment to grazing is that conflicts exist between livestock grazing and protection of lesser prairie-chicken habitat. The option to voluntarily relinquish grazing within the Planning Area would be carried forward in the next plan revision.

As part of livestock management guidelines, range improvement projects would be constructed where it is determined that these projects can enhance habitat. Improvements such as fencing, both traditional wire and “virtual” fences, and water development would be constructed to allow continued livestock use while improving habitat requirements for both lesser prairie-chickens and sand dune lizards. An example would be a cross fence in a large pasture, especially if only a portion of the pasture is suitable/occupied habitat that would divide the pasture along the suitable/occupied habitat line. By constructing the fence, livestock use could occur in the non-suitable portion during key time periods, while allowing growing season rest or no livestock in the suitable area while young are being reared. The same idea could be accomplished by adding additional water sources in a large pasture with few existing water sources. Adding another trough in non-suitable areas could draw livestock out of suitable areas during key time periods. As the technology becomes available, virtual” fencing, which is a combination of

satellite/computer/ear tag technology that provides stimuli to livestock to guide their movement, could also be used to move livestock out of key areas for certain time periods.

Range improvement projects would not be allowed if it is determined that the project could have negative impacts to habitat. An example would be a water trough, or any activity, that would concentrate livestock at the edge of a dune complex that has occupied or suitable habitat for sand dune lizards. Concentrating animals in such an area could break down the dune and reduce or eliminate the ability of sand dune lizards to survive.

Lands acquired within the Planning Area for special status species habitat would not be managed under the Taylor Grazing Act.

Wildlife

Under the Preferred Alternative most of the wildlife habitat needs or prescriptions are identified in other resource disciplines. Therefore refer to the minerals, livestock grazing, vegetation, recreation, land and realty and OHV for guidelines addressing sand dune lizard and lesser prairie-chicken habitats.

Predator control for the purpose of protecting sensitive wildlife species may be conducted on public lands within the Planning Area on a case by case basis. Any predator control actions would follow the protocol listed in the 1997 Roswell RMP.

Increased intensity in research and monitoring would be needed to evaluate changes in habitat condition, land use threats to the species, species use and distribution, reclamation efforts, propagation, and other projects that may help in enlarging the knowledge base of these species. Refer to Appendix 6 in the DEIS for a description of monitoring lesser prairie-chicken habitat.

BLM would support the propagation of lesser prairie-chicken and transplant efforts throughout the planning area, with an emphasis that the habitat parameters necessary for survival be in place prior to reintroduction; unless identified and needed for research projects. If necessary, BLM would pursue and propose changes to state wildlife management regulations on game species based on impacts to land resources and game populations.

BLM would continue reclamation practices on historical oil and gas disturbance areas for the betterment of rangeland health and wildlife species. These efforts would enhance distribution of special status species in appropriate habitats over the long term.

Recreation

Within the planning area, outside the Special Recreation Management Areas (SRMAs) there are Extensive Recreation Management Areas (ERMAs). Within these ERMAs recreation use includes hunting, OHV riding, photography, driving for pleasure, watchable wildlife, and dispersed camping.

Elements of public land users enjoy watching wildlife. Birdwatchers and photographers visit lek areas during booming season for the purpose of obtaining photographs and observing the lesser prairie-chickens engage in mating rituals. At present there is no data to support the premise that recreational activities within the planning area are the causes of species decline. However, through visitor monitoring in the planning area, if data becomes available that identifies recreational use as a factor in species decline, BLM would implement corrective

management actions such as; seasonal closures of roads leading to lek areas, noise restrictions in or around leks, or the issuance of Special Recreation Permits (SRP).

Based on monitoring visitor use and lesser prairie-chicken needs, if results indicate that a Special Recreation Permit (SRP) is the best method to regulate visitations in lek areas, then an SRP may be issued. If an SRP were to be issued, there would be no cost to the visitor/permittee. The SRP would allow visitations for the purpose of watching or photography to continue while tracking visitor use and spreading impacts so that one lek or group of leks does not bear the brunt of visitors. The issuance of a special recreation permit would contain specific stipulations regarding distance, noise, and interfering with the natural mating ritual of the lesser prairie-chicken. The Wildlife and Recreation Specialists in each Field Office would draft stipulations to be attached to a special recreation permit for the purpose of minimizing impact to mating areas.

During lesser prairie-chicken mating season, noise restrictions would be in effect from of March 1 through June 15 and from 3 a.m. to 9 a.m. Generators associated with recreation uses would not be allowed in or near identified mating areas during booming season. These conditions would be identified on interpretive signs and placed in key areas within the planning area.

Off-Highway Vehicle Management

Within the Planning Area, inventories, public review, and transportation planning would be conducted to support road by road designations for roads and trails suitable for Off Highway Vehicle (OHV) use. Pending completion of formal designations, the Planning Area would be managed as limited to existing roads and trails for off highway vehicle use. A preliminary road network is shown on Map R-1 in the DEIS.

Within the Planning Area, seasonal OHV use would be implemented based on monitoring of visitor use and needs of the lesser prairie-chicken and sand dune lizard. These restrictions would be implemented to protect booming areas adjacent to the OHV areas during booming season. If monitoring of special status species indicates the need for further restrictions, then no OHV use would be allowed in the Planning Area between the hours of 3 a.m. to 9 a.m. from March 1 through June 15.

Providing there would be no conflicts with lesser prairie-chicken and sand dune lizard habitat issues, the Mescalero Sands North Dune OHV Area would be expanded from the existing 562 acres to 1,674 acres in a three-phase plan based on monitored visitor use and demand. Phase One would be 418 acres to the North of the existing OHV boundary and would be limited to designated routes. Phase Two would be 295 acres south of the existing boundary designated open. Phase Three would be 399 acres east of the existing boundary designated open. A lesser prairie-chicken and sand dune lizard survey would be conducted prior to implementation of any phases since this OHV area borders the Core Management Area. See Map B-3 in the DEIS for the location of the phases.

Improvements to the existing facilities and the development of additional facilities would continue throughout the Mescalero Sands North Dune OHV Area, so long as they are compatible with management of special status species. Signage would be placed at key locations for interpretation and education of the recreating public and to show route designations.

The portion of the Hackberry Lake Intensive OHV Area (22,673 acres) located within the Planning Area, would be designated limited to existing designated routes with the exception of 132 acres of dune complex, known as the Shugart Dunes, which would remain open.

The Square Lake dune complexes are within the Planning Area and have historically been heavily used for OHV recreation. BLM would propose establishing the Square Lake OHV Area consisting of 5,974 acres designated as limited to existing routes and 817 acres of sand dunes designated as open. See Map B-4 in the DEIS for the location of the dunes and the designated roads and trails. Establishment of the proposed OHV area would be pending the results of the evaluation of the Habitat Evaluation Areas and a lack of conflicts with lesser prairie-chicken and sand dune lizard habitat protection.

The proposed Square Lake OHV Area would be limited to vehicles with a width of 50 inches or less. This would normally exclude the use of sand rails and dune buggies. Signage containing information and showing designated routes would be placed at key locations for interpretation and education of the recreating public.

Special Management Areas

The current designations for Areas of Critical Environmental Concern (ACECs) and special management areas (SMAs) would remain unchanged. The only ACEC in the Planning Area is the Mescalero Sands ACEC. The SMAs within the Planning Area are the Mathers Research Natural Area (RNA), Bear Grass Draw, Laguna Plata Archeological District, Maroon Cliffs Archeological District, and the Poco Site. (See Map NAA-1 – in the EIS)

Planning Area

The Planning Area amounts to about two percent of New Mexico and is located in the southeastern part of the State. The Planning Area comprises 1,852,946 acres of private, Federal and State Trust lands. Table 5 shows land ownership within the Planning Area.

Table 5
Land Ownership in the Planning Area

Ownership	Acres	Percent of Planning Area
Public Land (Managed by BLM)	847,491	45.7
Department of Energy	10,244	0.7
State Trust Lands	309,129	16.6
Private Lands	686,082	37.0
Total	1,852,946	100.0

SPECIES EVALUATIONS

ENDANGERED SPECIES

BLACK-FOOTED FERRET (*Mustela nigripes*)

Background

Status: The black-footed ferret was listed as endangered on March 11, 1967 (FWS 1989). The New Mexico Department of Game & Fish (NMDGF) also lists this species as "apparently extirpated wildlife" (NMDGF 1996).

Description of the Species: A weasel-like animal that has a yellow-buff coloration with black feet, tail tip and eye mask, and a blunt, light colored nose (FWS 1989). The body length is 38-46 centimeters (15-18 inches), tail length is 13-15 centimeters (5-6 inches) (*ibid*).

Distribution:

Range-wide: The black-footed ferret historically occurred throughout all or portions of the States of Colorado, Arizona, Utah, New Mexico, Kansas, Montana, Nebraska, Oklahoma, Texas, Wyoming, North and South Dakota, and the Provinces of Alberta and Saskatchewan, Canada (FWS 1989).

New Mexico: The black-footed ferret historically occurred over most of Northern and Central New Mexico (BLM 1984). The last confirmed sighting in New Mexico was in 1934 (BLM 1995). No black-footed ferrets are known to exist other than the captive and reintroduced populations in Wyoming, Montana, South Dakota, and Arizona. However, remnant populations may still exist in portions of the former range (*ibid*).

The best information available indicates that the black-footed ferret is extirpated from the wild in New Mexico (NMDGF 1996). However, in 1998, a captive breeding project was initiated in New Mexico at the Vermejo Park Ranch near Raton.

Chaves, Eddy, Lea, and Roosevelt Counties: Chaves, Eddy, Lea, and Roosevelt Counties are largely outside the historic range of the black-footed ferret (FWS 1989).

Habitat: This species is always associated with prairie dog towns in grassland plains, semi-arid grasslands and adjacent mountain basins up to 10,500 ft. (FWS 1989).

Recent Consultations: #1 - Within Sierra and Otero Counties (Federal Fluid Minerals Leasing and Development) in 2003 (Cons. #2-22-99-I-109A). The BLM made a "No Affect" determination. #2.- Fire and Fuels Management Plan Amendment and Environmental Assessment for Public Land in New Mexico and Texas (Potter County), July 2004 (Cons. #2-22-03-I-680). The BLM made a "No Affect" determination.

Effect Determination

Reasons for Decline/Vulnerability: From the available literature, it appears the decline in prairie dog colonies, and consequently the black-footed ferret throughout the west was related to Federal, State and local poisoning programs. Also, land use practices reduced available habitat by converting vast areas of the Great Plains to agriculture and urban areas.

Effects of the Proposed Action: Chaves, Eddy, Lea, and Roosevelt Counties are largely outside the historic range of the black-footed ferret, and the NMDGF lists this species as "apparently extirpated wildlife" (NMDGF 1996, FWS 1989).

The most recent information from the Fish and Wildlife Service (FWS 1989) indicates that prairie dog towns of the following sizes need to be surveyed if any disturbance is planned: (a) 80 acres for black-tailed prairie dogs, and (b) 200 acres for Gunnison's prairie dogs. The Carlsbad and Roswell Field Offices have conducted surveys for prairie dogs within the Planning Area, and no prairie dog colonies of size necessary to be surveyed have been identified on BLM administered land within Chaves, Eddy, Lea, and Roosevelt Counties. The prairie dog population within Chaves, Eddy, Lea, and Roosevelt Counties fluctuate up and down on a regular basis, mainly due to plague that occurs throughout New Mexico, and currently, plague appears to be the limiting factor in controlling the size of prairie dog colonies.

The existing prairie dog colonies will be protected (no habitat modification) as part of the Preferred Alternative, by moving any ground disturbing activity away from existing populations.

Based on the facts that Chaves, Eddy, Lea, and Roosevelt Counties are largely outside the historic range of the black-footed ferret, no habitat currently exists (e.g., large prairie dog colonies) necessary to support this species, and existing prairie dog colonies will be protected, it is not anticipated that there would be any impacts to the black-footed ferret from any of the proposed actions.

Conservation Measures/Stipulations to Minimize or Eliminate Effects:

- Each project will be scrutinized carefully for potential effects to existing prairie dog populations. If a prairie dog colony is found within a project area, the surface-disturbing activities will be managed so as not to affect the colony.

BLM Determination: Based on the analysis, the BLM has determined that implementation of the Preferred Alternative identified in the DEIS for Chaves, Eddy, Lea, and Roosevelt Counties would result in a "No Affect" situation for the black-footed ferret.

Rationale:

- Chaves, Eddy, Lea, and Roosevelt Counties are largely outside the historic range of the black-footed ferret. The black-footed ferret is apparently extirpated from the wild in New Mexico.

- No habitat (large prairie dog colonies) necessary to support this species has been identified on BLM-administered land within Chaves, Eddy, Lea, and Roosevelt Counties.

- Implementation of mitigating measures for the protection of prairie dog colonies during oil and gas and other development activities.

Cumulative Effects: The Preferred Alternative is anticipated to result in an overall improvement of wildlife habitat conditions within the planning area. Because the proposed action for Chaves, Eddy, Lea, and Roosevelt Counties has a "No Affect" for the black-footed ferret, there would be no increase in the existing or foreseeable future cumulative impacts within Chaves, Eddy, Lea, and Roosevelt Counties for this species. The cumulative impacts presently existing (e.g., Federal, private, state) for this species would not change due to this action.

NORTHERN APLOMADO FALCON (*Falco femoralis septentrionalis*)

Note: Unless otherwise cited data is derived from the U.S. Fish and Wildlife Service Biological Opinion for the Bennett Ranch Unit Gathering System in Otero County (FWS 2001).

Background

Status: The U.S. Fish and Wildlife Service listed the northern aplomado falcon as an endangered species on February 25, 1986 (FWS 2004). No critical habitat has been designated.

Description of the Species: Northern aplomado falcons are long-tailed falcons intermediate in size between the American kestrel (*Falco sparverius*) and prairie falcon (*F. mexicanus*). Female Aplomado falcons are larger than males; both sexes combined measure about 12-16 inches long and have a wingspan of about 31-inches. In the United States, aplomado falcons may occur sympatrically throughout the year with the American peregrine falcon, prairie falcon, American kestrel, merlin (*F. columbarius*) and the Arctic peregrine falcon outside of the breeding season. This emphasizes the need for careful observation to avoid confusion of suspected aplomado falcons with other more common falcons.

Distribution:

Range-Wide: Observations of aplomado falcons during the past decade have been reported sporadically throughout its historic range in the United States; however, many of these reports have been generally discounted due to lack of documentation. Historical and recent observations of aplomado falcons have been reported for New Mexico and west Texas.

New Mexico: Within New Mexico, aplomado falcons were historically reported from Dona Ana, Eddy, Grant, Hidalgo, Lea, Luna, Otero, and Sierra counties. The species formerly occurred regularly in summer (casual in winter) in the Southwest and possible farther east (Tularosa Basin), with the last specimen taken in 1939 and the last nesting documentation in 1952 (NMDGF 2002). Historic sightings are concentrated in the southwestern corner of New Mexico from Sierra and Dona Ana Counties to the Bootheel Region. In 2002, there was a confirmation of a breeding pair of aplomado falcons in southern in New Mexico (Howard 2003).

Chaves, Eddy, Lea, and Roosevelt Counties: There have been four sighting within Eddy and Lea Counties with the last one occurring in 1993 (See Table 6). There have been no sightings within Chaves or Roosevelt Counties. The Carlsbad and Roswell Field Offices manage very limited areas of mesquite and/or yucca grasslands habitat which is preferred by the falcon. Most of the land is a mosaic of Federal (BLM and military), State, and private ownership. A portion of the area falls within the northern extent of the aplomado falcon's range (Portions of Eddy and Lea Counties) with Chaves and Roosevelt counties falling outside of the aplomado's historical range.

TABLE 6
HISTORICAL AND RECENT SIGHTINGS OF APLOMADO FALCONS BY COUNTY

County	Historical Sightings 1853 – 1952	Recent Sightings 1962-2001
Eddy		12/1963 near Otis, 4/1988 30 mi E Carlsbad near Laguna Grande, 11/1993 Carlsbad
Lea		5/1962 San Simon Ranch

Williams 1998

Habitat: Habitat for the aplomado is variable over its range, but generally consists of open terrain with scattered trees or shrubs. The Chihuahuan Desert habitat consists of open grasslands with scattered mesquite and/or yuccas (*Yucca torreyi* and *Yucca elata*). These yucca plants that are used by the falcon and other raptors need to be large enough (e.g., generally branched) to support raptor nests.

Habitat components include; moderately low ground cover, an abundance of small to medium sized birds for forage, and a supply of nesting platforms, including large bromeliads and stick nests (FWS 2004). The falcons do not build their own nests; instead, they use old stick nests of other species sharing the same range and habitat. In desert habitats, nest availability is influenced by the presence of birds that build large size nests, such as crows, kites, ravens, or hawks (FWS 2004).

Recent Consultations: #1 - Within Sierra and Otero Counties (Federal Fluid Minerals Leasing and Development) in 2003 (Cons. #2-22-99-I-109A). The BLM made a "May Affect – Not Likely to Adversely Affect" determination and received concurrence from the U.S. Fish and Wildlife Service. #2. – Fire and Fuels Management Plan Amendment and Environmental Assessment for Public Land in New Mexico and Texas (Potter County), July 2004 (Cons. #2-22-03-I-680). The BLM made a "May Affect – Not Likely to Adversely Affect" determination and received concurrence from the U.S. Fish and Wildlife Service.

Effect Determination

Effects of the Proposed Action: Portions of Lea and Eddy Counties fall within the northern extent of the aplomado falcon's range, while Chaves and Roosevelt Counties fall outside the aplomado falcons range. There have been four sightings of aplomado falcons in Eddy and Lea Counties, the last one in 1993.

Based on the Reasonable Foreseeable Development, it anticipates the Preferred Alternative would have 49 wells (15-Gas and 34-Oil) drilled on an annual basis (245 acres of direct disturbance and 6,174 acres of indirect disturbance). Over the lifetime of this plan (20-Year projection) there would be approximately 4,900 acres of direct disturbance, however when compared to the acreage within the Planning Area (1,852,946 acres), the total direct disturbance over the life of this plan would be less than ½ of one percent.

In addition to disturbance from oil and gas development activities, there would be approximately 75 miles of geophysical activities occurring on an annual basis. This activity would create 75 acres of direct disturbance annually. Over the lifetime of this plan there would be approximately

1,500 acres of direct disturbance from this activity. However, the exact acreage would vary from year to year. The indirect effects (disturbance) from seismic operations would be relatively short term, not extending beyond the 1 to 2 days required to complete each segment of the geophysical work. The direct disturbance to soil and vegetation is considered minimal and there would be no anticipated changes in the animal community, habitat structure, or change in plant species composition and density within the seismic operation area. If seismic operations were to occur during the avian nesting season (March-June) within habitats of ground/shrub nesting birds some loss of nests could potentially occur. However, based on the 75 acres per year scattered over the Planning Area (1,852,946 acres), the potential impacts of seismic operations on nesting birds would be considered insignificant. In addition, many of the seismic operations would occur outside of the nesting season or not within nesting habitats, lessening the potential impacts from seismic operations even further.

Because approximately 55% of the oil and gas development disturbance is short-term (<3 years) and other previously disturbance sites would be reclaimed by implementing the reclamation and vegetative treatment activities as described in the Preferred Alternative (Pages 2-17), would result in positive long-term benefits by restoring grassland and other habitats within the Planning Area. Ultimately, the Preferred Alternative would result in an overall improvement of habitat for various wildlife species. However, using a habitat model developed by New Mexico Cooperative Fish and Wildlife Research Unit (NMCF&WRU 2002), the BLM has not identified any habitat for the aplomado falcon within the Planning Area (John Sherman - Per. Com. 2006).

Conservation Measures/Stipulations to Minimize or Eliminate Effects:

- Prior to initiating any projects during the raptor-breeding season, the project area shall be surveyed for raptor nests. Surveys shall be conducted by individuals approved by the Authorized Officer. All active raptor nests shall be avoided during the dates and by the distances listed below. An "active raptor nest" is defined as any raptor nest being used during the current nesting season.

  Distance: Eagle – 0.5 mile (800 meters)
  Peregrine Falcon – (900-3,400 meters)
  All other raptor species - Aplomado Falcons 1/8 mile (200 meters)

  Timing: Peregrine Falcon – variable (March 1-October 16)
  Aplomado Falcon – January 1 – July 31

- Pre-project planning will ensure that the yucca component (large-branched specimens) within the Planning Area is not damaged or lost by protecting these yuccas from oil and gas activities (e.g., moving locations).

- Within the Planning Area, occupied, suitable, or potential to become suitable habitat associated with the lesser prairie-chicken or sand dune lizard would be closed to leasing or leased with requirements for PODs and subsequent COAs to ensure orderly development with a minimum of surface impacts. This protection of lesser prairie-chicken and sand dune lizard habitats will ultimately help conserve grassland and other habitats within the Planning Area. These PODs and COAs would contain various strategies for minimizing impacts

associated with new development and for reclaiming developed areas. Methods to achieve this potential would include, but not be limited to, vegetative treatments, rehabilitation of pads, roads, and rights of way, and reduction of infrastructure needed to support the lease. They would be designed to improve habitat, enhance connectivity, reduce fragmentation, and move towards Desired Plant Community.

- Within the Planning Area, coordinated efforts to reclaim and restore habitat in previously developed sites would be carried out when and where opportunities arise. Attempts would be made to reclaim three previously disturbed acres for every one acre of new disturbance.

BLM Determination: Since very few northern aplomado falcons have ever been observed within Lea and Eddy Counties (last observation in 1993), no habitat has been identification to support this species within the Planning Area, and with implementation of conservation measures as described above, there would be no anticipated effects to the aplomado falcon. Therefore, it is the BLM's determination that the implementation of the Preferred Alternative identified in the DEIS for Chaves, Eddy, Lea, and Roosevelt Counties would result in a "No Affect" situation for the northern aplomado falcon.

Rationale:

- Only a small portion of the planning area (Southern Eddy and Lea Counties) falls within the northern extent of the historic northern aplomado falcon's range. Chaves and Roosevelt Counties fall completely outside of the historical falcon range.

- Using a habitat model developed by New Mexico Cooperative Fish and Wildlife Research Unit (NMCF&WRU 2002) the BLM has not identified any habitat to support the aplomado falcon within the Planning Area.

- Aplomado falcons have been seen only on a sporadic basis (four times within the last 40+ years) within Lea and Eddy Counties, with the last observation occurring in 1993.

- Conservation measures for nesting raptors would be utilized to help eliminate any potential impacts to nesting birds.

- Implementation of vegetative treatments, rehabilitation of pads, roads, and rights of way, and reduction of infrastructure needed to support leasing would help improve habitat, enhance connectivity, and reduce fragmentation.

Cumulative Effects: The Preferred Alternative is anticipated to result in an overall improvement of wildlife habitat conditions within the planning area. Because the proposed actions for Chaves, Eddy, Lea, and Roosevelt Counties has a "No Affect" for the Northern Aplomado Falcon, there would be no increase in the existing or foreseeable future cumulative impacts within Chaves, Eddy, Lea, and Roosevelt Counties for this species. The cumulative impacts presently existing (e.g., Federal, private, state activities) for this species would not change due to this action.

INTERIOR LEAST TERN (*Sterna antillarum athalassos*)

Background

Status: The interior least tern was listed as Endangered on May 28, 1985, without critical habitat (FWS 2004). It is also listed by the New Mexico Game & Fish as Threatened (*ibid)*.

Description of the Species: Least terns are robin-sized birds about 21 cm (8 inches) long with a wingspan of 50 cm (20 inches). The sexes are alike, characterized in the breeding plumage by a black crown, white forehead, grayish back and dorsal wing surfaces, snowy white undersurfaces, yellow legs, and black-tipped yellow bill (FWS 2004).

Distribution:

Range-Wide: The interior least tern was found along the sandbars and shorelines of the Colorado (Texas), Red, Rio Grande (Texas), Arkansas, Missouri, Ohio, and Mississippi River systems; the braided rivers of southwest Kansas and northwest Oklahoma; the salt flats in northwest Oklahoma, and playa lakes in New Mexico (FWS 2004).

New Mexico: In New Mexico, the interior least tern is found mainly in the southeast, in and around Bitter Lake National Wildlife Refuge.

Chaves, Eddy, Lea, and Roosevelt Counties: This species is presently known in Chaves County along the Pecos River within the Bitter Lake National Wildlife Refuge. It would only be considered an accidental migrant to Eddy, Lea, and Roosevelt Counties, and the remainder of Chaves County.

Habitat: Preferred tern habitat is associated with riverine areas where the birds use the sparsely vegetated sand and gravel bars within a wide river channel or salt flats along lake shorelines for nesting. This species is a colonial nesting shorebird and although it is associated with water, it spends most of its time on sand bars, playas, or snatching its food from the surface of the water. The riverine nesting areas of the tern are sparsely vegetated sand and gravel bars within a wide, unobstructed river channel or salt flats along lake shorelines.

Recent Consultations: #1 - Within Sierra and Otero Counties (Federal Fluid Minerals Leasing and Development) in 2003 (Cons. #2-22-99-I-109A). The BLM made a "May Affect – Not Likely to Adversely Affect" determination and received concurrence from the U.S. Fish and Wildlife Service. #2. – Fire and Fuels Management Plan Amendment and Environmental Assessment for Public Land in New Mexico and Texas (Potter County), July 2004 (Cons. #2-22-03-I-680). The BLM made a "May Affect – Not Likely to Adversely Affect" determination and received concurrence from the U.S. Fish and Wildlife Service.

Effect Determination

Effects of the Proposed Action: No habitats (e.g., rivers/lakes) have been identified on BLM administered lands within the Planning Area that would support the interior least tern within Chaves, Eddy, Lea and Roosevelt Counties. This bird would only be considered an accidental migrant within Eddy, Lea and Roosevelt Counties.

BLM Determination: Based on the analysis, that no habitat to support this species is found within the Planning Area, and the only known nesting for this species occurs at Bitter Lakes Wildlife Refuge, which is outside of the Planning Area, the BLM has determined that implementation of the Preferred Alternative identified in the DEIS for Chaves, Eddy, Lea and Roosevelt Counties would result in a "No Affect" situation for the interior least tern.

Rationale:

- Known distribution of the interior least tern in New Mexico is very limited, with the only known nesting occurring in Chaves County at Bitter Lakes Wildlife Refuge (Which is outside the Planning Area). This bird would only be considered an accidental migrant within Eddy, Lea and Roosevelt Counties, and the remainder of Chaves County.

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- No habitats (e.g., rivers/lakes) have been identified on BLM administered lands within the Planning Area that would support the interior least tern within Chaves, Eddy, Lea and Roosevelt Counties.

Cumulative Effects: The Preferred Alternative is anticipated to result in an overall improvement of wildlife habitat conditions within the planning area. Because the proposed actions for Chaves, Eddy, Lea and Roosevelt Counties has a "No Affect" for the interior least tern, there would be no increase in the existing or foreseeable future cumulative impacts within Chaves, Eddy, Lea and Roosevelt Counties for this species. The cumulative impacts presently existing (e.g., Federal, private, state activities) for this species would not change due to this action.

KUENZLER'S HEDGEHOG CACTUS (*Echinocereus fendleri*)

Background

Status: The Kuenzler's hedgehog cactus was listed as endangered on October 26, 1979 (FWS 2004). This species is also listed as endangered under the New Mexico Endangered Plant Species Act (*ibid*).

Description of the Species: This species is conical to short cylindrical, up to 25 centimeters (10 inches) tall (FWS 2004). It is dark green in color with bright magenta flowers (*ibid*).

Distribution:

Range-Wide/New Mexico: This species is presently only known from Chaves, Eddy, Lincoln, and Otero Counties, New Mexico (FWS 2004).

Chaves, Eddy, Lea, and Roosevelt Counties: Potential habitat has been identified for areas east of McGregor Range, southeast Otero County (BLM 1996). One population of Kuenzler's cactus was found in 1998 on BLM administered land in Eddy County, just across the line from Otero County (Ladyman et. al. 1998). However, based on habitat requirements no habitat is known to occur east of the Pecos River within Chaves or Eddy Counties (John Sherman/Dan Baggau – Per. Com. 2006). This species is not known to occur within Lea or Roosevelt Counties (FWS 2004).

Habitat: This species grows between rocks on gently sloping limestone outcroppings in pinion-juniper woodlands and grasslands at about 5,800-6,200 feet elevation (FWS 2004). This species is rare within its range (BLM 2002).

Recent Consultations: #1 - Within Sierra and Otero Counties (Federal Fluid Minerals Leasing and Development) in 2003 (Cons. #2-22-99-I-109A). The BLM made a "May Affect – Not Likely to Adversely Affect" determination and received concurrence from the U.S. Fish and Wildlife Service. #2. – Fire and Fuels Management Plan Amendment and Environmental Assessment for Public Land in New Mexico and Texas (Potter County), July 2004 (Cons. #2-22-03-I-680). The BLM made a "No Affect" determination.

Effect Determination

Effects of the Proposed Action: The occurrence of this species on BLM administered land within Chaves and Eddy Counties is extremely limited based on potential habitat (BLM 1996). This species habitat is not known to occur east of the Pecos River, which is outside the Planning Area (John Sherman/Dan Baggau - Per. Com. 2006).

Based on the Reasonable Foreseeable Development, it anticipates the Preferred Alternative would have 49 wells (15-Gas and 34-Oil) drilled on an annual basis (245 acres of direct disturbance). Over the lifetime of this plan (20-Year projection) there would be approximately 4,900 acres of direct disturbance, however when compared to the acreage within the Planning Area (1,852,946 acres), the total direct disturbance over the life of this plan would be less than ½ of one percent. All of this activity will occur outside the known population and/or habitat areas for this species.

In addition to disturbance from oil and gas development activities, there would be approximately 75 miles of geophysical activities occurring on an annual basis. This activity would create 75 acres of direct disturbance annually. Over the lifetime of this plan there would be approximately 1,500 acres of direct disturbance from this activity. However, the exact acreage would vary from year to year. All of this activity will occur outside the known population and/or habitat areas for this species.

BLM Determination: Based on the analysis, that this species' habitat is not found within the Planning Area, and the only known occurrence within Chaves and Eddy Counties are west of the Pecos River, which are outside of the Planning Area, the BLM has determined that implementation of the Preferred Alternative identified in the DEIS for Chaves, Eddy, Lea and Roosevelt Counties would result in a "No Affect" situation for the Kuenzler's hedgehog cactus.

Rationale:

- This species' habitat is not found within the Planning Area, and the only known occurrence within Chaves and Eddy Counties are west of the Pecos River, which are outside of the Planning Area.

Cumulative Effects: Because the proposed actions for Chaves, Eddy, Lea and Roosevelt Counties has a "No Affect" for the Kuenzler's hedgehog cactus, there would be no increase in the existing or foreseeable future cumulative impacts within Chaves, Eddy, Lea and Roosevelt Counties for this species. The cumulative impacts presently existing (e.g., Federal, private, state activities) for this species would not change due to this action.

Pecos gambusia (*Gambusia nobilis*)

Background

Status: The Pecos gambusia, *Gambusia nobilis*, was federally listed as endangered on Oct. 13, 1970 (FWS 2004), and listed as endangered in 1975 by the State of New Mexico (19 NMAC 33.1).

Description of the Species (FWS 2004): (Pecos gambusia) is a small, livebearing member of the Poeciliidae. Poeciliids are characterized by strong sexual dimorphism. The anal fin of males is modified into a gonopodium, an intromittent organ used in copulation. Gonopodial structures distinguish G. nobilis from the other poeciliids (i.e., Gambusia affinis and Gambusia geiseri) known to occur within its native range. Spines of ray 3 elongated; hooks on rays 4p and 5a small and rounded; located near terminal end of gonopodium; elbow on ray 4a located opposite the serrae of 4p, composed of 3 or 4 fused segments. Color patterns are useful in making preliminary field identifications and morphometric characters, although environmentally plastic, aid in identification. In profile the back is arched; robust; caudal peduncle, depth approximately two thirds the head length. Margins of scale pockets are outlined in black. The dorsal fin has a subbasal row of spots. Females have a black area on the abdomen that surrounds the anus and anal fin. The caudal fin normally lacks spots but a faint median row may occur. The Pecos gambusia is metallic colored; best distinguished by the lack of extensive carotenoid (yellowish) pigmentation.

Distribution:

Range-Wide: The Pecos gambusia is endemic to springs and spring systems of the Pecos River basin of southeastern New Mexico and western Texas (Hubbs and Springer, 1957). It apparently did not regularly inhabit the Pecos River itself (*ibid*). In Texas, the species historically inhabited Comanche Springs and the Leon Creek drainage (also referred to as Diamond Y Draw in some publications) and near Fort Stockton in a series of springs in the Toyah drainage near Balmorhea (Echelle and Echelle, 1980). In the Toyah Creek drainage, Pecos gambusia occur mainly in one gravity-flow spring (East Sandia) and in three artesian springs (Phantom, San Solomon, and Griffin) and their associated habitats. Generally, Pecos gambusias were common to abundant in spring habitats.

New Mexico/Chaves, Eddy, Lea and Roosevelt Counties: The springs and gypsum sinkholes on Bitter Lake National Wildlife Refuge (near Roswell) and Blue Spring and its outflow (near Whites City) apparently are the only areas of regular occurrence of Pecos gambusia in New Mexico (Bednarz, 1979; Echelle and Echelle, 1980). The largest population is at Blue Spring, where many thousands of these fish occur (Koster 1957). The state's other, much smaller population occupies a rather different habitat that being the limestone sinks and associated areas on Bitter Lake National Wildlife Refuge. In Blue Spring, Pecos gambusia were

common in headwaters and diminished in abundance in the spring run as it flowed to its confluence with Black River (Bednarz, 1979; Echelle and Echelle, 1980). Within ponded habitats and gypsum sink holes on Bitter Lake NWR and Blue Spring, New Mexico, the Pecos gambusia appears stable.

Habitat: The Pecos gambusia is most common in heads and runs of springs, where it uses such cover as aquatic vegetation for refuge (Bednarz 1975, 1979). The Pecos gambusia associates in loose schools that spend much of the time near the surface, typically near the edges of any body of water. The Pecos gambusia inhabits shallow areas of alkaline waters with aquatic vegetation for cover.

Recent Consultations: Fire and Fuels Management Plan Amendment and Environmental Assessment for Public Land in New Mexico and Texas (Potter County), July 2004 (Cons. #2-22-03-I-680). The BLM made a "No Affect" determination.

Effect Determination

Effects of the Proposed Action: The known distribution of the Pecos gambusia in New Mexico is very limited, with the only known populations occurring in springs and gypsum sinkholes on the at Bitter Lakes Wildlife Refuge and at Blue Springs near White City (FWS 2004). Both of these locations are outside of the Planning Area boundary.

BLM Determination: Based on the analysis that this species does not occur and no habitat to support this species is found on BLM administered land within the Planning Area, the BLM has determined that implementation of the Preferred Alternative identified in the DEIS for Chaves, Eddy, Lea and Roosevelt Counties would result in a "No Affect" situation for the Pecos gambusia.

Rationale:

- This species is found only within the Bitter Lakes Wildlife Refuge and at Blue Springs near White City, which are both outside the Planning Area boundary.

- No habitat exists on BLM administered land within the Planning Area to support this species.

Cumulative Effects: The Preferred Alternative is anticipated to result in an overall improvement of wildlife habitat conditions within the planning area. Because the proposed actions for Chaves, Eddy, Lea and Roosevelt Counties have a "No Affect" for the Pecos gambusia, there would be no increase in the existing or foreseeable future cumulative impacts within Chaves, Eddy, Lea and Roosevelt Counties for this species. The cumulative impacts presently existing (e.g., Federal, private, state activities) for this species would not change due to this action.

Sneed pincushion cactus (*Coryphantha sneedii var sneedii*)

Background

Status: Sneed pincushion cactus was listed as an endangered species on November 07, 1979 (FWS 2004).

Description of the Species (FWS 2004): In cultivation the pincushion is grown from seed and also readily propagated from offsets, and therefore readily available. It is tolerant of a wide range of conditions in cultivation. *Coryphantha sneedii var. sneedii* intergrades with *Coryphantha strobihformis* in the Franklin Mountains, and its similarity to that species may cause some collectors to overlook it.

Distribution:

Range-Wide: All known populations are located in Dona Ana and El Paso Counties, New Mexico and Texas, respectively (FWS, 2004).

New Mexico: Sneed pincushion cactus is known from the northern Chihuahuan Desert east of Las Cruces, New Mexico in Dona Ana County. It was discovered in 1921, and has been sought by collectors since that time, even though the plant can be propagated in cultivation (FWS 2004).

Chaves, Eddy, Lea and Roosevelt Counties: This species is not known to occur within Chaves, Eddy, Lea and Roosevelt Counties (FWS 2004).

Habitat: This plant species occupies rocky, limestone soils, steep slopes and broad alluvial fan communities.

Recent Consultations: Fire and Fuels Management Plan Amendment and Environmental Assessment for Public Land in New Mexico and Texas (Potter County), July 2004 (Cons. #2-22-03-I-680). The BLM made a "No Affect" determination.

Effect Determination

Effects of the Proposed Action: This species is known only from east of Las Cruces, New Mexico in Dona Ana County, which is outside the Planning Area boundary. Because this species does not occur within the Planning Area, any proposed actions would have no effects on this species.

BLM Determination: Based on the analysis that this species does not occur within the Planning Area, the BLM has determined that implementation of the Preferred Alternative within the DEIS for Chaves, Eddy, Lea and Roosevelt Counties would result in a "No Affect" situation for the Sneed Pincushion Cactus.

Rationale:

- This species does not occur within the Planning Area.

Cumulative Effects: Because the Preferred Alternative for Chaves, Eddy, Lea and Roosevelt Counties has a "No Affect" for the Sneed Pincushion Cactus there would be no increase in the existing or foreseeable future cumulative impacts within Chaves, Eddy, Lea and Roosevelt Counties for this species. The cumulative impacts presently existing (e.g., Federal, private, state activities) for this species would not change due to this action.

PROPOSED ENDANGERED SPECIES

Koster's springsnail (*Juturnia kosteri*) Proposed Critical Habitat

Background

Status: The Koster's springsnail was listed as "Proposed Endangered with Critical Habitat" in 2002 (FWS 2002).

Description of the Species: Koster's springsnail is a totally aquatic species that occurs in slow-velocity water in springs and streams (Taylor et al. 1985).

Distribution:

Range-Wide/New Mexico/Chaves, Eddy, Lea and Roosevelt Counties: Koster's spring snail is endemic to southeastern New Mexico (Taylor 1987). This species is known only from Chaves County, New Mexico with one population in a spring at the Roswell Country Club and four others on Bitter Lake National Wildlife Refuge (Taylor 1987). These areas are key habitat for the species in the state and overall (NMDGF, 2004).

The populations of this snail on the Bitter Lake National Wildlife Refuge are large and appear safe under present management practices (Taylor et al. 1985). The Roswell Country Club population is marginal, largely as the result of such management practices as landscaping, pesticide use, and ponding of the habitat.

Habitat: This species occupies mainly soft substrates, such as mud and organic debris. However, it occurs occasionally on pebbles and among vegetation at the Roswell Country Club.

Recent Consultations: Fire and Fuels Management Plan Amendment and Environmental Assessment for Public Land in New Mexico and Texas (Potter County), July 2004 (Cons. #2-22-03-I-680). The BLM made a "No Affect" determination.

Effect Determination

Effects of the Proposed Action: This species is known only from one population in a spring at the Roswell Country Club and four others on Bitter Lake National Wildlife Refuge, which are both outside of the Planning Area boundary. Because this species does not occur within the Planning Area, any proposed actions would have no effects on this species.

BLM Determination: Based on the analysis that this species is limited to the Roswell Country Club and the Bitter Lake National Wildlife Refuge, which are both outside the Planning Area boundary, the BLM has determined that implementation of the Preferred Alternative identified in the DEIS for Chaves, Eddy, Lea and Roosevelt Counties would result in a "No Affect" situation for the Koster's springsnail.

Rationale:

- This species does not occur within the Planning Area. Known distribution of the Koster's springsnail in New Mexico occurs within the Roswell Country Club and the Bitter Lake National Wildlife Refuge.

Cumulative Effects: Because the Preferred Alternative for Chaves, Eddy, Lea and Roosevelt Counties has a "No Affect" for the Koster's springsnail, there would be no increase in the existing or foreseeable future cumulative impacts within Chaves, Eddy, Lea and Roosevelt Counties for this species. The cumulative impacts presently existing (e.g., Federal, private, state activities) for this species would not change due to this action.

Pecos assiminea snail (Ass*iminea pecos*) Proposed Critical Habitat

Background

Status: The Pecos assiminea snail was listed as "Proposed Endangered with Critical Habitat" in 2002 (FWS 2002).

Description of the Species: Assimineas are essentially terrestrial snails, living on moist substrates within a few cm of the water surface.

Distribution:

Range-Wide: The Pecos assiminea is known only from the Pecos Basin of southeastern New Mexico and adjacent western Texas (Taylor 1987). The disjunctive population in Texas occurs in Diamond Y Draw, (Pecos Co.).

New Mexico/Chaves, Eddy, Lea and Roosevelt Counties: In New Mexico, this species is now confined to an area along the Lost River in the Bitter Lake National Wildlife Refuge. This is the key habitat area for the species in the state and one of two for it overall. A population formerly occurred at the Roswell County Club, but it has been extirpated as the result of habitat loss or alteration, including destruction of vegetation and possibly the use of chemicals (NMDGF, 1988).

Habitat: They select a humid microclimate, such as within mats of sedges or beneath other vegetation along muddy shores next to flowing water. They feed, presumably, on bacteria, fungi, algae, and associated items.

Recent Consultations: Fire and Fuels Management Plan Amendment and Environmental Assessment for Public Land in New Mexico and Texas (Potter County), July 2004 (Cons. #2-22-03-I-680). The BLM made a "No Affect" determination.

Effect Determination

Effects of the Proposed Action: This species is confined to the Bitter Lake National Wildlife Refuge, which is outside of the Planning Area boundary. It formerly occurred at the Roswell Country Club, but has been extirpated. Because this species does not occur within the Planning Area, any proposed actions would have no effects on this species.

BLM Determination: Based on the analysis that this species is limited to the Bitter Lake National Wildlife Refuge which is outside the Planning Area, the BLM has determined that implementation of the Preferred Alternative identified in the DEIS for Chaves, Eddy, Lea and Roosevelt Counties would result in a "No Affect" situation for the Pesos assiminea snail.

Rationale:

- This species does not occur within the Planning Area. Known distribution of the Pesos assiminea snail in New Mexico is limited to the Bitter Lake National Wildlife Refuge.

Cumulative Effects: Because the Preferred Alternative for Chaves, Eddy, Lea and Roosevelt Counties has a "No Affect" for the Pesos assiminea snail, there would be no increase in the existing or foreseeable future cumulative impacts within Chaves, Eddy, Lea and Roosevelt Counties for this species. The cumulative impacts presently existing (e.g., Federal, private, state activities) for this species would not change due to this action.

Roswell pyrg (*Pyrgulopsis roswellensis*) Proposed Critical Habitat

Background

Status: The Roswell pyrg was listed as "Proposed Endangered with Critical Habitat" in 2002 (FWS 2002).

Description of the Species: The Roswell pyrg is an aquatic, gilled species (Taylor et al. 1985). These animals feed on algae and organic detritus (*ibid*).

Distribution:

Range-Wide/New Mexico/Chaves, Eddy, Lea and Roosevelt Counties: The Roswell pyrg is endemic to southeastern New Mexico (Taylor 1987). This snail occurs only in a spring at the Roswell Country Club and in three springs/seepage areas on the Bitter Lake National Wildlife Refuge (*ibid*).

Habitat: It is most common on limestone rubble in swift water emitting from springs. However, the species can survive in tiny seepage areas, as long as flows are perennial. Densities in this species are related to current velocity, the numbers of snails diminish as the current slows.

Recent Consultations: Fire and Fuels Management Plan Amendment and Environmental Assessment for Public Land in New Mexico and Texas (Potter County), July 2004 (Cons. #2-22-03-I-680). The BLM made a "No Affect" determination.

Effect Determination

Effects of the Proposed Action: This species is known only from a spring at the Roswell Country Club and three others on Bitter Lake National Wildlife Refuge, which are both outside of the Planning Area boundary. Because this species does not occur within the Planning Area, any proposed actions would have no effects on this species.

BLM Determination: Based on the analysis that this species is limited to the Roswell Country Club and the Bitter Lake National Wildlife Refuge, which are both outside the Planning Area boundary, the BLM has determined that implementation of the Preferred Alternative identified in the DEIS for Chaves, Eddy, Lea and Roosevelt Counties would result in a "No Affect" situation for the Roswell pyrg.

Rationale:

- This species does not occur within the Planning Area. Known distribution of the Roswell pyrg in New Mexico is limited to the Roswell Country Club and the Bitter Lake National Wildlife Refuge.

Cumulative Effects: Because the Preferred Alternative for Chaves, Eddy, Lea and Roosevelt Counties has a "No Affect" for the Roswell pyrg, there would be no increase in the existing or foreseeable future cumulative impacts within Chaves, Eddy, Lea and Roosevelt Counties for this species. The cumulative impacts presently existing (e.g., Federal, private, state activities) for this species would not change due to this action.

Noel's amphipod (*Gammarus desperatus*) Proposed Critical Habitat

Background

Status: The Noel's amphipod was listed as "Proposed Endangered with Critical Habitat" in 2002 (FWS 2002).

Description of the Species: Amphipods as a group are mainly active during darkness, spending the daylight hours hiding in vegetation and other cover (FWS 2004). Freshwater amphipods usually occupy cool, unpolluted waters with an abundance of oxygen (*ibid*).

Distribution:

Range-Wide/New Mexico/Chaves, Eddy, Lea and Roosevelt Counties: Noel's amphipod is endemic to southeastern New Mexico (FWS 2004). The "Historic range" of Noel's amphipod includes areas of New Mexico, but has not been found beyond the state's borders (*ibid*). This species was described from North Spring on the Roswell Country Club (population not found in 1988), and similar animals have been found at nearby Lander Springbrook (population now extinct) and recently at Lost River on Bitter Lake National Wildlife Refuge (*ibid*). Amphipods taken near Carlsbad may also be referable to G. desperatus, but their taxonomic relationships have not yet been resolved (*ibid*).

Habitat: The habitat of Noel's amphipod consists of springs in areas derived from Permian marine sediments (FWS 2004). They are omnivorous in diet, feeding especially on algae and organic debris that includes carrion (*ibid*).

Recent Consultations: Fire and Fuels Management Plan Amendment and Environmental Assessment for Public Land in New Mexico and Texas (Potter County), July 2004 (Cons. #2-22-03-I-680). The BLM made a "No Affect" determination.

Effect Determination

Effects of the Proposed Action: This species is now known only from the Bitter Lake National Wildlife Refuge and potentially the Roswell Country Club, which are both outside of the Planning Area boundary. Because this species does not occur within the Planning Area, any proposed actions would have no effects on this species.

BLM Determination: Based on the analysis that this species is limited to the Bitter Lake National Wildlife Refuge and potentially the Roswell Country Club, which are both outside the Planning Area boundary, the BLM has determined that implementation of the Preferred Alternative identified in the DEIS for Chaves, Eddy, Lea and Roosevelt Counties would result in a "No Affect" situation for the Noel's amphipod.

Rationale:

- This species does not occur within the Planning Area. Known distribution of the Noel's amphipod in New Mexico is limited to the Bitter Lake National Wildlife Refuge and potentially the Roswell Country Club.

Cumulative Effects: Because the Preferred Alternative for Chaves, Eddy, Lea and Roosevelt Counties has a "No Affect" for the Noel's amphipod there would be no increase in the existing or foreseeable future cumulative impacts within Chaves, Eddy, Lea and Roosevelt Counties for this species. The cumulative impacts presently existing (e.g., Federal, private, state activities) for this species would not change due to this action.

THREATENED SPECIES

BALD EAGLE (*Haliaeetus leucocephalus*)

Background

Status: In July 1994, the U.S. Fish and Wildlife Service proposed to reclassify the bald eagle from endangered to threatened in the lower 48 states, including the southwestern region and Mexico. The bald eagle was re-classified on August 11, 1995 (FWS 2004). This species is also listed as threatened by the New Mexico Department of Game & Fish (*ibid*).

The bald eagle population is in an upward trend throughout the United States, where breeding pairs have increased from 417 in 1963 to 5,750 in 1998 (NMDGF 2000). The largest populations are found in Alaska and Canada, as well as significant populations in Washington, Oregon, Minnesota, Wisconsin, and Michigan (FWS 2004).

Description of the Species: The bald eagle is a large hawk-like bird that is 3 feet long and has a wingspan of 6-7 feet (FWS 2004). Adults have a white head, neck and tail, a curved yellow beak and un-feathered feet (*ibid*).

Distribution:

Range-Wide: Bald eagles ranged throughout the contiguous United States, Canada, and northern Mexico (FWS 2004). Historically this species was not very abundant in the southwestern United States (*ibid*).

New Mexico: This species occupies New Mexico primarily as a migrant and winter resident (FWS 2004).

Chaves, Eddy, Lea and Roosevelt Counties: Bald eagles are known to nest at only one site in Southern New Mexico, Caballo Reservoir in Sierra County (BLM 1996). No known nesting has been documented within Chaves, Eddy, Lea or Roosevelt Counties.

Habitat: Bald eagles are generally associated with medium to large perennial streams, rivers and other water bodies that provide an adequate prey base and appropriate nesting/roosting habitat. Outside of the major river corridors (e.g., Rio Grande, Pecos), the bald eagle has been observed to be a migrant only, due to the lack of appropriate habitats.

Recent Consultations: #1 - Within Sierra and Otero Counties (Federal Fluid Minerals Leasing and Development) in 2003 (Cons. #2-22-99-I-109A). The BLM made a "May Affect – Not Likely to Adversely Affect" determination and received concurrence from the U.S. Fish and Wildlife Service. #2. – Fire and Fuels Management Plan Amendment and Environmental Assessment for Public Land in New Mexico and Texas (Potter County), July 2004 (Cons. #2-22-03-I-680). The BLM made a "May Affect – Not Likely to Adversely Affect" determination and received concurrence from the U.S. Fish and Wildlife Service.

Effect Determination

Effects of the Proposed Action: Very limited habitat exists on BLM administered land within Chaves, Eddy, Lea and Roosevelt Counties that could support the bald eagle. The Pecos River and associated Brantley Reservoir are the only large riverine habitats within these counties and they are both outside the Planning Area boundary. Because no habitats (e.g., large riverine/lake systems) occur within the Planning Area boundary, any proposed actions would have no effects on this species.

Except for migration, there are no known uses of Chaves, Eddy, Lea and Roosevelt Counties by this species.

BLM Determination: Based on the analysis that no habitat occurs within the Planning Area to support this species, the BLM has determined that implementation of the Preferred Alternative identified in the DEIS for Chaves, Eddy, Lea and Roosevelt Counties would result in a "No Affect" situation for the bald eagle.

Rationale:

- Known distribution of the Bald Eagle in New Mexico is very limited, and the only known nesting in Southern New Mexico occurs at Caballo Reservoir in Sierra County. This bird would be considered only an accidental migrant within Chaves, Eddy, Lea and Roosevelt Counties.

- No habitat (e.g., riverine/lakes) have been identified on BLM administered land within the Planning Area boundary that would support the bald eagle.

Cumulative Effects: The Preferred Alternative is anticipated to result in an overall improvement of wildlife habitat conditions within the planning area. Because the proposed actions for Chaves, Eddy, Lea and Roosevelt Counties has a "No Affect" for the Bald Eagle, there would be no increase in the existing or foreseeable future cumulative impacts within Chaves, Eddy, Lea and Roosevelt Counties for this species. The cumulative impacts presently existing (e.g., Federal, private, state activities) for this species would not change due to this action.

MEXICAN SPOTTED OWL (*Strix occidentalis lucida*)

Background

Status: The Mexican spotted owl was listed as threatened on March 16, 1993 (FWS 1993). This species is currently not listed by the New Mexico Department of Game & Fish (*ibid*). No critical habitat has been designated by the FWS on any BLM administered land within the Planning Area.

Description of the Species: The Mexican spotted owl is a medium-sized owl with large dark eyes and no ear tufts that closely resembles the barred owl (FWS 1993). Plumage is brown with numerous white spots (*ibid*). The length is about 17 inches and wingspan is 3.3 feet (*ibid*).

Distribution:

Range-Wide: The range for the Mexican spotted owl extended from the southern Rocky Mountains in Colorado and the Colorado Plateau in southern Utah southward through Arizona and New Mexico, and far western Texas, through the Sierra Madre Occidental and Oriental, to the mountains at the southern end of the Mexican Plateau (FWS 1993).

New Mexico: In New Mexico, the owl has been recorded in all montane regions from the San Juan, Jemez, and Sangre de Cristo Mountains in the north, to the Guadalupe and Animas Mountains in the south. The largest concentration occurs in the Mogollon and Sacramento Mountains. Other records exist for Navajo Lake, Mountainair, lower San Francisco Valley, Estancia, Grants, Hurley, Burro Mountains, Carlsbad Caverns National Park, and San Andres National Wildlife Refuge (FWS 1993).

Chaves, Eddy, Lea and Roosevelt Counties: This species is only known to occur within the Guadalupe Mountains (Forest Service) and Carlsbad Caverns National Park (FWS 1993).

Habitat: The Mexican spotted owl occupies mountainous areas, with its preferred habitat consisting of dense, multi-storied forests with moderately closed to closed canopies. In addition, these owls have been found in canyon systems with little or no tree cover and appear to provide the same or similar microclimate as dense multi-storied forests (FWS 1993).

Recent Consultations: #1 - Within Sierra and Otero Counties (Federal Fluid Minerals Leasing and Development) in 2003 (Cons. #2-22-99-I-109A). The BLM made a "No Affect" determination. #2. – Fire and Fuels Management Plan Amendment and Environmental Assessment for Public Land in New Mexico and Texas (Potter County), July 2004 (Cons. #2-22-03-I-680). The BLM made a "May Affect – Not Likely to Adversely Affect" determination and received concurrence from the U.S. Fish and Wildlife Service.

Effect Determination

Effects of the Proposed Action: No suitable or potential forest/canyon habitats to support Mexican spotted owls have been identified on BLM administered land within the Planning Area. The woodland habitats within the planning area are comprised mainly of piñon-juniper stands, with a few scattered ponderosa pine trees. Based on the fact no habitat to support this species exists within the Planning Area boundary, there would be no effects from any proposed action on the Mexican spotted owl.

Conservation Measures/Stipulations to Minimize or Eliminate Effects:

- No proposed actions will occur within any forest/canyon habitats that may be identified in the future that could support Mexican spotted owls.

BLM Determination: Based on the analysis that no habitat to support this species is found within the Planning Area boundary, and if any habitat were identified in the future it would be protected, the BLM has determined that implementation of the Preferred Alternative identified in the DEIS for Chaves, Eddy, Lea and Roosevelt Counties would result in a "No Affect" situation for the Mexican spotted owl.

Rationale:

- No habitat (e.g., forest/canyon) exists on BLM administered land to support this species within the Planning Area boundary. The woodland habitat within the Planning Area is comprised of piñon-juniper stands, with a few scattered ponderosa pine trees.

- No proposed actions will occur within any forest/canyon habitats that may be identified in the future that could support Mexican spotted owls.

Cumulative Effects: The Preferred Alternative is anticipated to result in an overall improvement of wildlife habitat conditions within the planning area. Because the proposed actions for Chaves, Eddy, Lea and Roosevelt Counties has a "No Affect" for the Mexican Spotted Owl, there would be no increase in the existing or foreseeable future cumulative impacts within Chaves, Eddy, Lea and Roosevelt Counties for this species. The cumulative impacts presently existing (e.g., Federal, private, state activities) for this species would not change due to this action.

Pecos bluntnose shiner (*Notropis simus pecosensis*)

Background

Status: The Pecos bluntnose shiner was listed by the State of New Mexico as threatened (19 NMAC 33.1) in 1976 (FWS, 1987). The species is listed as endangered in Texas (TPWD 1993) and the Republic of Mexico (Mex. Ministry of Soc. Dev. 1991). Abundance of the Pecos bluntnose shiner has declined considerably in the past 50 years (NMDGF 2004).

Description of the Species: The bluntnose shiner is a relatively small, moderately deep-bodied minnow, rarely exceeding 80 mm. The Pecos bluntnose shiner is a pelagic broadcast spawner; females release their non-adhesive, semi-buoyant eggs in the water column and males immediately fertilize them (NMDGF 2004). After fertilization, the eggs drift with the current. Development of eggs is rapid and larvae hatch in 24 to 48 hrs (*ibid*).

Distribution:

Range-Wide/New Mexico: The bluntnose shiner is endemic to the Rio Grande and Pecos Rivers in New Mexico and the El Paso/Cuidad Juarez area of Texas and Chihuahua (Gilbert 1980; Chernoff et al. 1982). Records attributed to this species from downstream reaches of the Rio Grande in Texas (Gilbert 1980) are actually of a similar species, the now extinct phantom shiner (Chernoff, et al. 1982).

Chaves, Eddy, Lea and Roosevelt Counties: Pecos bluntnose shiner historically occupied the Pecos River from near Santa Rosa downstream to the vicinity of Major Johnson Springs (now inundated by Brantley Reservoir) (Hatch et al. 1985). Currently, this shiner is found only in the Pecos River from about the U.S. 60 Highway Bridge near Fort Sumner downstream to Artesia, and seasonally within the inflow area of Brantley Reservoir.

Within the Carlsbad Field Office, designated critical habitat occurs from the Chaves/Eddy county line to Highway 82 running east Artesia, NM.

Habitat: Hatch et al. (1985) reported that Pecos bluntnose shiner may live three years, but most individuals probably survive less than two years. Most growth occurs in the first year of life. At least two or three age-classes normally are found in the Pecos River between Old Fort State Park and Roswell whereas the population between Roswell and Brantley Reservoir typically is composed of Age-0 or -1 fish. Maturity is attained by Age 1. Hatch et al. (1985) reported an Age-2 female with >1000 maturing and mature eggs, but most of each year's reproductive effort is by Age-1 individuals that produce fewer eggs (<500)/female).

Recent Consultations: Fire and Fuels Management Plan Amendment and Environmental Assessment for Public Land in New Mexico and Texas (Potter County), July 2004 (Cons. #2-22-03-I-680). The BLM made a "May Affect – Not Likely to Adversely Affect" determination and received concurrence from the U.S. Fish and Wildlife Service.

Effect Determination

Effects of the Proposed Action: The Pecos River and associated Brantley Reservoir are the only areas this species is known to inhabit, which are both outside the Planning Area boundary. Based on the fact that this species does not occur within the Planning Area, there would be no effects from any proposed action on the Pecos bluntnose shiner.

BLM Determination: Based on the analysis that this species does not occur within Planning Area, the BLM has determined that implementation of the Preferred Alternative identified in the DEIS for Chaves, Eddy, Lea and Roosevelt Counties would result in a "No Affect" situation for the Bluntnose Shiner.

Rationale:

- This species does not occur within the Planning Area. Bluntnose shiner habitat is found only along the Pecos River and the inflow at Brantley Reservoir.

Cumulative Effects: The Preferred Alternative is anticipated to result in an overall improvement of wildlife habitat conditions within the planning area. Because the proposed actions for Chaves, Eddy, Lea and Roosevelt Counties has a "No Affect" for the Bluntnose shiner, there would be no increase in the existing or foreseeable future cumulative impacts within Chaves, Eddy, Lea and Roosevelt Counties for this species. The cumulative impacts presently existing (e.g., Federal, private, state activities) for this species would not change due to this action.

Pecos sunflower (*Helianthus paradoxus*)

Background

Status: This plant was listed as threatened on October 20, 1999 (FWS 2004).

Description of the Species: The Pecos sunflower differs from the common sunflower (H. annuus) in having narrower, lanceolate leaves (vs. deltoid leaves), fewer hairs on the leaves, nearly glabrous stems, lanceolate phyllaries (vs. deltoid phyllaries), slightly smaller flower heads with fewer ray flowers, and flowering confined to autumn (September, October) as compared to the spring through fall flowering of the common sunflower. The habitat of Pecos sunflower is also different from that of the common sunflower. Pecos sunflower grows in saturated, saline soils of marshes while the common sunflower usually occurs in disturbed soils that are dry during mid-summer. Pecos sunflower is the only sunflower in the Southwest United States that requires permanent wetlands for its survival.

Distribution:

Range-Wide/New Mexico: This species is found at widely separated locations in central and southern New Mexico and into Texas. It may once have been more common but suitable habitat within the range is declining. Texas has only one extant population. A couple of the New Mexico populations are large, but others are very small and non-viable. Species is very vulnerable to changes in natural hydrologic regimes. In New Mexico the population at the Bitter Lake National Wildlife Refuge is the most secure. The impoundments and springs at the wildlife refuge are relatively stable and it is not anticipated that they will be seriously altered. The other significant New Mexico population is near the town of Santa Rosa in the upper Pecos River basin. This largest and best population of Pecos sunflower is on private land that the owner would prefer to drain rather than conserve.

Chaves, Eddy, Lea and Roosevelt Counties: There only known population in Southern New Mexico is found at the Bitter Lake National Wildlife Refuge (Chaves County) which is outside the Planning Area boundary. There are no known populations of this species within Eddy, Lea or Roosevelt Counties or the remainder of Chaves County.

Habitat: Pecos sunflowers grow in saline soils that are permanently saturated. Areas that maintain these conditions are commonly called cienegas (desert wetlands) associated with springs. However the required conditions may be also be found at stream margins and at the margins of impoundments. Where plants are associated with the latter the impoundments have replaced the natural cienegas.

Recent Consultations: Fire and Fuels Management Plan Amendment and Environmental Assessment for Public Land in New Mexico and Texas (Potter County), July 2004 (Cons. #2-22-03-I-680). The BLM made a "May Affect – Not Likely to Adversely Affect" determination and received concurrence from the U.S. Fish and Wildlife Service.

Effect Determination

Effects of the Proposed Action: This species is not known to occur within Chaves, Eddy , Lea or Roosevelt Counties except at the Bitter Lake National Wildlife Refuge which is outside the Planning Area boundary. No riparian/cienegas habitat exists within the Planning Area boundary necessary to support this species. Based on the fact that this species does not occur within the Planning Area, and no habitat has been identified to support this species there would be no effects from any proposed action on the Pecos sunflower.

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BLM Determination: Based on the facts that this species is not known to occur and no habitat (e.g., riparian/cienegas) exists within the Planning Area necessary to support this species, the BLM has determined that implementation of the Preferred Alternative identified in the DEIS for Chaves, Eddy, Lea and Roosevelt Counties would result in a "No Affect" situation for the Pecos Sunflower.

Rationale:

- This species is not known to occur within Chaves, Eddy, Lea or Roosevelt Counties except at the Bitter Lake National Wildlife Refuge which is outside the Planning Area boundary.

- No riparian/cienegas habitat exists within the Planning Area boundary necessary to support this species

Cumulative Effects: The Preferred Alternative is anticipated to result in an overall improvement of wildlife habitat conditions within the planning area. Because the Preferred Alternative for Chaves, Eddy, Lea and Roosevelt Counties has a "No Affect" for the Pecos Sunflower, there would be no increase in the existing or foreseeable future cumulative impacts within Chaves, Eddy, Lea and Roosevelt Counties for this species. The cumulative impacts presently existing (e.g., Federal, private, state activities) for this species would not change due to this action.

Gypsum wild-buckwheat (*Eriogonum gypsophilum*) Critical Habitat

Background

Status: On January 19, 1981, the Gypsum wild-buckwheat was designated as Threatened with critical habitat (FWS 2004).

Description of the Species: This member of the knotweed family is a small, erect, herbaceous perennial, which measures about 1.2-2 dm (8 inches) high, is restricted to gypsum soils. It is a perennial herb with a branching flower stalk arising from a cluster of basal leaves (FWS 2004).

Distribution:

Range-Wide/New Mexico/Chaves, Eddy, Lea and Roosevelt Counties: This plant's entire range (15 populations at 3 general localities) is limited to a 0.2 square mile (130 acres) area in the Seven Rivers' Hills of Eddy County at elevations from 3,290 to 3,450 feet (FWS 2004). The area occupied by Gypsum wild-buckwheat is public land managed by the Bureau of Land Management and the Water and Power Resources Service. The Critical Habitat is located on land administered entirely by the Bureau of Land Management. Gypsum wild-buckwheat was first collected in 1908 southwest of Lakewood, New Mexico (Wooten and Standley, 1913).

Habitat: Gypsum wild-buckwheat is restricted to almost open, pure gypsum in grama grassland that is sparsely vegetated with other gypsophilous plants such as *Coldenia hispidissima*, *Mentzelia humilis*, and *Anulocaulis leiosolenus* at about 1,000-1,100 m (3,280-3,600 ft).

Recent Consultations: Fire and Fuels Management Plan Amendment and Environmental Assessment for Public Land in New Mexico and Texas (Potter County), July 2004 (Cons. #2-22-03-I-680). The BLM made a "No Affect" determination.

Effect Determination

Effects of the Proposed Action: This species known distribution is limited to the Seven Rivers' Hills, which are outside the Planning Area boundary. Because this species does not occur within the Planning Area, any proposed actions would have no effects on this species.

BLM Determination: Based on the analysis that this species is limited to the Seven Rivers' Hills of Eddy County which is outside the Planning Area boundary, the BLM has determined that implementation of the Preferred Alternative identified in the DEIS for Chaves, Eddy, Lea and Roosevelt Counties would result in a "No Affect" situation for the Gypsum wild-buckwheat.

Rationale:

- This species does not occur within the Planning Area. Known distribution of the Gypsum wild-buckwheat in New Mexico is limited to the Seven Rivers' Hills area.

Cumulative Effects: Because the Preferred Alternative for Chaves, Eddy, Lea and Roosevelt Counties has a "No Affect" for the Gypsum wild-buckwheat, there would be no increase in the existing or foreseeable future cumulative impacts within Chaves, Eddy, Lea and Roosevelt Counties for this species. The cumulative impacts presently existing (e.g., Federal, private, state activities) for this species would not change due to this action.

Lee pincushion cactus (*Coryphantha sneedii var leei*)

Background

Status: Lee pincushion cactus was first listed as a threatened species on October 25, 1979.

Distribution:

Range-Wide/New Mexico/Chaves, Eddy, Lea and Roosevelt Counties: This cactus is known from 10 populations in Carlsbad Caverns National Park, New Mexico. In 1982 and 1983, BLM biologists conducted extensive field surveys, but did not discover any new populations outside the park boundary. However, in 1998 the New Mexico Natural Heritage Program conducted surveys north of Carlsbad Caverns National Park and found a single specimen, and in 1999, continued their survey efforts and found approximately 75 additional plants.

Habitat: This species generally occurs on north facing slopes in limestone hills at elevations ranging from 4,100-5,900. They grow in shallow soils on stair-step limestone cracks and shelves of broken terrain and steep slopes, in Carlsbad Caverns National Park. Vegetation ranges from short grassland brush to Pinion-Juniper. Similar habitat occurs on BLM lands surrounding the park.

Recent Consultations: Fire and Fuels Management Plan Amendment and Environmental Assessment for Public Land in New Mexico and Texas (Potter County), July 2004 (Cons. #2-22-03-I-680). The BLM made a "May Affect – Not Likely to Adversely Affect" determination and received concurrence from the U.S. Fish and Wildlife Service.

Effect Determination

Effects of the Proposed Action: This species known distribution is limited to the Carlsbad Caverns National Park and vicinity which is outside the Planning Area boundary. Because this species does not occur within the Planning Area, any proposed actions would have no effects on this species.

BLM Determination: Based on the analysis that this species does not occur within the Planning Area, the BLM has determined that implementation of the Preferred Alternative identified in the DEIS for Chaves, Eddy, Lea and Roosevelt Counties would result in a "No Affect" situation for the Lee Pincushion Cactus.

Rationale:

- This species does not occur within the Planning Area. The known distribution of Lee's Pincushion Cactus is within Carlsbad Caverns National Park and its immediate vicinity.

Cumulative Effects: Because the Preferred Alternative for Chaves, Eddy, Lea and Roosevelt Counties has a "No Affect" for the Lee Pincushion Cactus, there would be no increase in the existing or foreseeable future cumulative impacts within Chaves, Eddy, Lea and Roosevelt Counties for this species. The cumulative impacts presently existing (e.g., Federal, private, state activities) for this species would not change due to this action.

CANDIDATE SPECIES

Lesser prairie chicken (*Tympanuchus pallidicinctus*)

Background

Status: For the lesser prairie chicken the earliest systematic survey in Texas was conducted in 1940. At that time, the range of the lesser prairie-chicken encompassed portions of 20 counties. In addition to those counties, researchers reported that museum specimens existed for five additional counties, although there is uncertainty whether two of the five specimens were actually Greater Prairie-chicken and Attwater's prairie-chicken. Researchers considered the occupied range at that time to be a reduction from the historical range. In 1989, Texas Parks and Wildlife Department (TPWD) produced an occupied range map that encompassed portions of 13 counties, with an estimate range of 5,732 square kilometers (2213 square miles); a net loss of 7,931 square kilometers (3,062 square miles) since 1940. In 2001, TPWD reported that the estimated occupied range is unchanged from the 1989 estimate. Recognizing the severity of the threats to the lesser prairie chicken, the U.S. Fish and Wildlife Service determined that listing was warranted but precluded making it a candidate for listing with the highest priority for action a species can receive.

Description of the Species: Bailey (1928) describes the lesser prairie chicken as follows; "Male: wing 8.2-8.3 inches, tail 4-4.2. Female: wing 8-8.2 inches, tail 3.5-4. The legs are scantily feathered to toe, in front and on sides; sides of neck with erectile tufts of elongated feathers, 2.5 inches or more in length. Adult male: Head with a slight soft crest, neck with inflatable air-sacs, yellow on breeding season; upper-parts pale brownish, black barred in sets of threes, a wide brown bar enclosed by two narrow dusky bars, similarly barred. Adult female: Similar but neck tufts rudimentary. Young: under-parts yellowish-brown, feathers with conspicuous white shaft streaks and large black blotches; under-parts yellowish-white, with grayish brown bars."

Distribution:

Range-Wide: In Texas the lesser prairie-chicken is regarded as an upland game bird with a legal harvest season (requiring a special permit) for a limited number of days in October (TPWD 1993). In 2000, TPWD estimated that based on mail-in responses of 248 permitted hunters, approximately 244 lesser prairie-chickens were harvested, while 49 birds were shot but not recovered. No recent estimates of population size are published. Spring lek surveys in the Permian Basin and western panhandle of Texas indicate slight increases in the density of males per lek from 5.9 in 2000 to 6.6 in 2001. However, the long-term trend of lesser prairie-chicken populations in this region continues downward, and no information was provided regarding the number of leks surveyed or density of leks over a given area. In the northeastern panhandle of Texas, males per lek declined from 12.0 in 2000 to 10.5 in 2001, a decrease of 14 percent.

New Mexico: In New Mexico, in the 1920s and 1930s, the former range of the lesser prairie-chicken was described as all of the sandhill rangeland of eastern New Mexico, from Texas to Colorado, and west to Buchanan in De Baca County. Ligon (1927) mapped the breeding range at that time as encompassing portions of seven counties, a small subset of what he described as former range. In the 1950s and 1960s, occupied range was more extensive, indicating reoccupation of some areas. Presently, the New Mexico Department of Game and Fish reports that lesser prairie-chicken are known in portions of seven counties, and that they

have apparently been extirpated from 3,346 square kilometers (1,292 square miles) of its original 22,390 square kilometer (8,645 square mile) range. In New Mexico the lesser prairie-chicken is an upland game bird, although the hunting season has been closed since 1996. Estimates of occupied range in New Mexico over the last century suggest a pattern of decline and increase, including reoccupation of former range. In the 1950s, the population was estimated at 40,000 to 50,000, and by 1972, at 6,000 to10,000 individuals. No recent estimates of population size are available. However, survey data from 1971 through 1997 analyzed by the New Mexico Natural Heritage show a clear and substantial population decline after 1988, particularly in the southern periphery of their range.

Chaves, Eddy, Lea and Roosevelt Counties: For all intents and purposes, lesser prairie-chicken populations south of highway 380 (Eddy and Lea County) in New Mexico on Bureau of Land Management properties and surrounding areas are very near extirpation. Intensive spring 2001 lek surveys on the Carlsbad BLM Field Office detected only one remaining active lek populated by two males. Recent surveys have found small, scattered groups of birds near areas of historic lek sites.

Habitat: In southeastern New Mexico, lesser prairie chickens exist in the shrub-dominated High Plains Bluestem Subtype by using mixed stands of tall grass and shinnery oak (Riley et al. 1992). The climax vegetation in these areas was probably dominated by mid and tall grasses, including sand bluestem, big bluestem (A. gerardi), little bluestem, yellow Indiangrass (Sorghastrum nutans), prairie sandreed (Calamovilfa longifolia), and grama grasses, with smaller amounts of yucca (Yucca spp.), Harvard oak, sand sagebrush, mesquite (Prosopis spp.), and fragrant sumac (Rhus aromatica) (Morrissey, 1995). Lesser prairie chickens in shinnery oak eat mostly plant material except in summer, when insects, mainly grasshoppers predominate. An absence of acorns in the diet probably relates less to preference and more to the variability of shin-oak acorn production. Autumn diets primarily consisted of shinnery oak acorns, short-horned grasshoppers (Acrididae), broom groundsel (Senecio spartioides) leaves, and insect galls from shinnery oak. Foods consumed in the winter primarily consisted of shinnery oak acorns with lesser amounts of green vegetation and insect (Riley et al. 1996). Grasshoppers constitute by far the largest item in the animal diet. Beetles, bugs, and caterpillars comprise, for the most part, the balance.

Recent Consultations: Fire and Fuels Management Plan Amendment and Environmental Assessment for Public Land in New Mexico and Texas (Potter County), July 2004 (Cons. #2-22-03-I-680). The BLM made a "May Affect – Not Likely to Adversely Affect" determination and received concurrence from the U.S. Fish and Wildlife Service.

Effect Determination

Effects of the Proposed Action: The Preferred Alternative is anticipated to result in an overall improvement of wildlife habitat conditions for the lesser prairie chicken within the planning area.

Core Management Area (CMA) - The CMA would be expanded to include the existing Mescalero Sands ACEC as one contiguous block. The CMA would be closed to new oil and gas leasing. Under certain limited exceptions, new oil and gas leasing may occur on a case-by-case basis; i.e., for pooling or drainage protection that does not impact suitable habitat. Within the CMA, no new mineral material sites will be authorized.

For existing leases, Plans of Development (PODs) and appropriate Conditions of Approval (COAs) would be required to ensure orderly development with a minimum of surface impact in lesser prairie-chicken habitat. Included in PODs and COAs would be specifications for various strategies for minimizing impacts associated with new development and for reclaiming developed areas.

Primary Population Area (PPA) - Areas designated as occupied, suitable, potentially suitable and unsuitable habitat within the PPA are shown on Map B-5 in the DEIS.

Occupied and suitable lesser prairie-chicken habitat in the PPA would be closed to new oil and gas leasing. However, certain exceptions would be considered on a limited, case-by-case basis when indicated due to presence of existing infrastructure, or as needed for pooling or drainage protection purposes; and if leasing and subsequent development would not impact habitat. In these cases, a no surface occupancy (NSO) stipulation would be applied to the lease. Within the PPA, no new mineral material sites will be authorized in occupied or suitable prairie-chicken habitat.

Areas designated as potentially suitable lesser prairie-chicken habitat would be available for new oil and gas leasing. If leasing and development in these areas would impact suitable habitat, then areas designated as potentially suitable habitat would be closed to new oil and gas leasing. Areas of potentially suitable habitat where lands can be used to "block up" larger surrounding areas of suitable habitat would also be closed to new leasing.

New oil and gas leasing would be allowed in areas designated as unsuitable habitat subject to standard lease terms and appropriate timing and noise restrictions unless such habitat occurs inside the State Game Commission-owned Prairie-Chicken area or where development would extend an impact/avoidance zone into suitable lesser prairie-chicken habitat. BLM would determine if habitat is suitable or unsuitable prior to issuing a new oil and gas lease.

Sparse and Scattered Population Area (SSPA) - Occupied lesser prairie-chicken habitat (within 1.5 miles of the lek) would be closed to new leasing. New leasing with a No Surface Occupancy (NSO) requirement may be allowed, where this is determined to be appropriate, i.e., pooling or drainage protection that does not impact suitable habitat. Within the SSPA, no mineral material sites will be authorized in occupied prairie-chicken habitat.

Isolated Population Area (IPA) - Occupied lesser prairie-chicken habitat (e.g. within 1.5 miles from an active lek) would be closed to new leasing. New leasing with a No Surface Occupancy (NSO) requirement may be allowed, where this is determined to be appropriate, i.e., pooling or drainage protection that does not impact suitable habitat. Within the IPA, no new mineral material sites will be authorized within 1.5 miles of an active lek.

Isolated Population Area – Habitat Evaluation Areas - Habitat suitability analyses would be conducted in the 17 Habitat Evaluation Areas (HEAs) (See Map B-1 – in the DEIS). These areas would be prioritized for reclamation potential and for potential to re-established connectivity to adjacent isolated habitat blocks. Until the evaluation of an area is complete, new oil and gas leasing would be deferred. It may be determined, through the suitability analysis process, that these areas would be discretionarily closed

to future oil and gas leasing. Criteria for closing these areas or making these areas available for lease can be found in Appendix 8 in the DEIS. Areas determined to be lacking high conservation value would be managed according to the IPA prescriptions

BLM would consider new oil and gas leasing in occupied and suitable habitat throughout the Planning Area at such time the lesser prairie-chicken is no longer considered for listing as a threatened and endangered species. At that time if new leases are offered, conditions would be attached to new leases that would preclude the lesser prairie-chicken returning to a Special Status Species.

Based on the Reasonable Foreseeable Development, it anticipates the Preferred Alternative would have 49 wells (15-Gas and 34-Oil) drilled on an annual basis (245 acres of direct disturbance and 6,174 acres of indirect disturbance). Over the lifetime of this plan (20-Year projection) there would be approximately 4,900 acres of direct disturbance, however when compared to the acreage within the Planning Area (1,852,946 acres), the total direct disturbance over the life of this plan would be less than ½ of one percent.

Refer to the "Description of the Preferred Alternative" (Pages 2-17) for complete description of the beneficial measures incorporated in the Environmental Impact Statement. Based on the implementation of the following conservation measures, it is anticipated that there will be an overall improvement of wildlife habitat for the lesser prairie chicken.

Conservation Measures/Stipulations to Minimize or Eliminate Effects (For a complete list refer to the Description of the Preferred Alternative Pages 2-17):

- Within the Planning Area timing (March 1st to June 15th, from the hours of 3:00 a.m. to 9:00 a.m.) and noise stipulations would be applied. These stipulations are intended to prevent disruption of mating and nesting by activities associated with energy exploration and development.

- To reduce habitat fragmentation in occupied or suitable lesser prairie-chicken habitat, new distribution power lines, commercial or domestic, within two miles of occupied lesser prairie-chicken habitat (measured from the lek) would be buried. Under this requirement only distribution lines of less than 36 KV capacities would be buried. In addition, to avoid habitat fragmentation from height obstructions, low profile tanks would be required in occupied lesser prairie-chicken habitat.

- The Core Management Area and occupied habitat within the Primary Population Area would be designated as right-of-way avoidance areas. Lands acquired as habitat for Special Status Species would be added to the right-of-way avoidance areas. Rights-of-way for projects and facilities such as fences, range and wildlife water pipelines, power distribution lines, access to oil and gas facilities, or oil and gas collection or distribution pipelines would be considered in avoidance zones on a case-by-case basis.

- Within the Planning Area, the Core Management Area would be closed to new oil and gas leasing. Under certain limited exceptions, new oil and gas leasing may occur on a case-by-case basis; i.e., for pooling or drainage protection that does not impact suitable habitat.

- Within the Planning Area, occupied and suitable lesser prairie-chicken habitat in the Primary Population Area would be closed to new oil and gas leasing. Under certain limited exceptions, new oil and gas leasing may occur on a case-by-case basis; i.e., for pooling or drainage protection that does not impact suitable habitat.

- Occupied lesser prairie-chicken habitat would be closed to new oil and gas leasing within the Sparse and Scattered and Isolated Population areas.

BLM Determination: Based on the analysis that the Preferred Alternative is anticipated to result in an overall improvement of wildlife habitat conditions for the lesser prairie chicken, the BLM has determined that implementation of the proposed actions identified in the DEIS for Chaves, Eddy, Lea and Roosevelt Counties would result in a "May Affect – Not Likely to Adversely Affect" (Mostly Beneficial) situation for the lesser prairie chicken.

Rationale:

- Within the Planning Area timing (March 1st to June 15th, from the hours of 3:00 a.m. to 9:00 a.m.) and noise stipulations would be applied. These stipulations are intended to prevent disruption of mating and nesting by activities associated with energy exploration and development.

- Removal of roads and linear features would reduce fragmentation and create larger blocks of contiguous habitat which would benefit the species. Fewer roads would also reduce potential human disturbance in the reclaimed areas. In Addition, re-vegetation of reclamation sites would benefit lesser prairie chickens by creating additional suitable habitat.

- Removal of power lines would benefit the species by eliminating structures that are avoided by lesser prairie chickens.

- Closing large areas of the Planning Area (Core Management Area, Primary Population Area) to new oil and gas leasing and avoidance areas for Right-of-Ways would improvement habitat conditions for the lesser prairie chicken.

Cumulative Effects: The Preferred Alternative is anticipated to result in an overall improvement of wildlife habitat conditions within the planning area. Because the Preferred Alternative for Chaves, Eddy, Lea and Roosevelt Counties has a "May Affect-Not Likely to Adversely Affect" determination for the lesser prairie chicken, there would be no measurable incremental increase in the existing or foreseeable future cumulative impacts within Chaves, Eddy, Lea and Roosevelt Counties for this species. In fact, there is likely to be a decrease in the foreseeable future cumulative impacts within Chaves, Eddy, Lea and Roosevelt Counties for this species due to the implementation of beneficial actions to reduce in negative impacts on the lesser prairie chicken.

Sand Dune Lizard (*Sceloporus arenicolus*)

Background

Status: The Center for Biological Diversity and Chihuahuan Desert Conservation Alliance petitioned the U.S. Fish and Wildlife Service on May 28, 2002 to list the sand dune lizard as an endangered species under the Endangered Species Act. Recognizing the severity of the threats to the sand dune lizard, the U.S. Fish and Wildlife Service determined that listing was warranted but precluded making it a candidate for listing with the highest priority for action a species can receive.

Description of the Species: The sand dune lizard is a small, light brown (often yellowish brown) lizard lacking dorsal pattern except for faint grayish brown dorso-lateral stripe on each side extending from head to tail, that buries itself in sand to avoid predators and regulate its body temperature. Lizards are active from 0800 until dusk during May, June, and July (Sena, 1985), but confined their activity during midday (1200-1400) to shaded areas beneath vegetation. Individuals are extremely wary, and are quick to seek shelter in burrows, beneath leaf litter or by burrowing in loose sand.

Sand dune lizards' feed upon ants and their pupae, small beetles (including ladybirds) and their larvae crickets, grasshoppers, and spiders. Most feeding appears to take place within or immediately adjacent to patches of vegetation.

Distribution:

Range-Wide/New Mexico: The sand dune lizard has the second smallest range of any lizard endemic to North America, only occurring in a narrow crescent shaped area of southeastern New Mexico and in Andrews, Crane, Gaines, Ward and Winkler Counties in western Texas.

Chaves, Eddy, Lea and Roosevelt Counties: It has been found mainly on the Mescalero Sands, which extend in a broad arc from the vicinity of San Juan Mesa in northeastern Chaves County southward and eastward through eastern Eddy County and southern Lea County (Sena, 1985).

Habitat: The Sand dune lizard is restricted to the vicinity of active and semi-stabilized sand dunes within the Mescalero Sands, an area of rolling dunes in southeastern New Mexico. Much of its habitat is found on lands administered by the Bureau of land Management. These dunes occur to an elevation of 1190 m above sea level and support scattered stands of shinnery oak (*Quercus havardii)* and sand sage (*Artemisia filifolia*) as co-dominant plant species (Sena, 1985). Significant reductions of lizard population sizes are associated with removal of shinnery oak due to oil and gas development and herbicide spraying.

Recent Consultations: Fire and Fuels Management Plan Amendment and Environmental Assessment for Public Land in New Mexico and Texas (Potter County), July 2004 (Cons. #2-22-03-I-680). The BLM made a "No Affect" determination.

Effect Determination

Effects of the Proposed Action: The Preferred Alternative is anticipated to result in an overall improvement of wildlife habitat conditions for the Sand Dune Lizard within the planning area. Refer to the "Description of the Preferred Alternative" (Pages 2-17) for an in-depth description of the beneficial measures incorporated in the DEIS.

Based on the Reasonable Foreseeable Development, it anticipates the Preferred Alternative would have 49 wells drilled on an annual basis (245 acres of direct disturbance). Over the lifetime of this plan (20-Year projection) there would be approximately 4,900 acres of direct disturbance, however when compared to the acreage within the Planning Area (1,852,946 acres), the total direct disturbance over the life of this plan would be less than ½ of one percent. However, based on the implementation of the following conservation measures, it is anticipated that there will be an overall improvement of wildlife habitat for the sand dune lizard.

Conservation Measures/Stipulations to Minimize or Eliminate Effects (For a complete list refer to the Description of the Preferred Alternative Pages 2-17):

- Tracts not currently under lease within Sand Dune Lizard Habitat (see Map B-1 in the DEIS) would be closed to new oil and gas leasing until BLM determines that development of tracts nominated for leasing can be developed without impacting dune complexes. Depending on the results of that determination, the closure of a particular tract may continue, or be offered for lease with a No Surface Occupancy requirement or other appropriate stipulations, including standard stipulations.

- Lands acquired as habitat for Special Status Species would be added to the right-of-way avoidance areas. Rights-of-way for projects and facilities such as fences, range and wildlife water pipelines, power distribution lines, access to oil and gas facilities, or oil and gas collection or distribution pipelines would be considered in avoidance zones on a case-by-case basis.

- For existing leases in sand dune lizard habitat (see Map B-1 in the DEIS) surveys would be required prior to permitting surface disturbing activities and conducted by personnel approved by BLM. Depending on the results of the survey, proposed well sites may not be available to be developed and directional drilling may be necessary to develop all spacing units within a lease. Existing leases would require PODs which incorporate the results of the lizard surveys. The purpose of a POD is to assist the operator and BLM with planning for orderly development as a means to reduce or eliminate impacts to special status species habitat. A POD would also incorporate applicable best management practices and disclose all future well locations; the location and arrangement of well infrastructure (e. g., tank batteries, compressors, power lines and poles); road locations; and rights-of-way.

BLM Determination: Based on the analysis that the Preferred Alternative is anticipated to result in an overall improvement of wildlife habitat conditions for the Sand Dune Lizard, the BLM has determined that implementation of the proposed actions identified in the DEIS for Chaves, Eddy, Lea and Roosevelt Counties would result in a "May Affect – Not Likely to Adversely Affect" (Mostly Beneficial) situation for the Sand Dune Lizard.

Rationale:

- Tracts not currently under lease within Sand Dune Lizard Habitat (see Map B-1 in the EIS) would be closed to new oil and gas leasing until BLM determines that development of tracts nominated for leasing can be developed without impacting dune complexes.

- For existing leases in sand dune lizard habitat (see Map B-1 in the EIS) surveys would be required prior to permitting surface disturbing activities and conducted by personnel approved by BLM. Depending on the results of the survey, proposed well sites may not be available to be developed and directional drilling may be necessary to develop all spacing units within a lease.

Cumulative Effects: The Preferred Alternative is anticipated to result in an overall improvement of wildlife habitat conditions within the planning area. Because the Preferred Alternative for Chaves, Eddy, Lea and Roosevelt Counties has a "May Affect-Not Likely to Adversely Affect" determination for the sand dune lizard, there would be no measurable incremental increase in the existing or foreseeable future cumulative impacts within Chaves, Eddy, Lea and Roosevelt Counties for this species. In fact, there is likely to be a decrease in the foreseeable future cumulative impacts within Chaves, Eddy, Lea and Roosevelt Counties for this species due to the implementation of beneficial actions to reduce in negative impacts on the sand dune lizard.

Texas hornshell (*Popenaias popei*)

Background

Status: This species was listed as a Candidate species on October 30, 2001. Status assessment of the Texas hornshell throughout its historic range is ongoing with inventory efforts being coordinated between the NMDGF, Texas Parks and Wildlife Department, U.S. Fish and Wildlife Service, and private land stewards.

Description of the Species: Like other freshwater mussels, this species is a filter-feeder--straining suspended organic particles from water pumped through the mantle.

Distribution:

Range-Wide: Historically, the Texas hornshell occurred in the lower Pecos River of New Mexico, downstream throughout the lower Rio Grande (Brownsville, Texas) and major tributaries in Texas, southward to the Río Pánuco drainage of San Luis Potosí, México (Metcalf 1982).

New Mexico/Chaves, Eddy, Lea and Roosevelt Counties: In New Mexico, this species was common in the lower Pecos River from North Spring River near Roswell in Chaves County (Cockerell 1902), including the Black and Delaware rivers, Eddy County (Metcalf 1982). The hornshell has declined notably throughout its historic range.

Habitat: This mussel occurs in sand and sand-cobble accumulated in travertine bedrock cracks and at the base of large boulders at depths of 0.25-1.38 m and at flow rates of 0.02-0.75 m/sec; often in colonies; often at the head or lower end of travertine runs (Lang et al. 1998). The species imbeds itself in softer bottoms, exposing only the siphonal areas in such situations. In rocky sites, it lodges itself in cracks and crevices. In the latter situation, the species is probably immobile, whereas it undoubtedly moves about in substrates such as mud and sand.

Recent Consultations: Fire and Fuels Management Plan Amendment and Environmental Assessment for Public Land in New Mexico and Texas (Potter County), July 2004 (Cons. #2-22-03-I-680). The BLM made a "No Affect" determination.

Effect Determination

Effects of the Proposed Action: This species' known distribution is limited to the Pecos, Black and Delaware Rivers, which are all outside the Planning Area boundary. Because this species does not occur within the Planning Area, any proposed actions would have no effects on this species.

BLM Determination: Based on the analysis that this species does not occur within the Planning Area, the BLM has determined that implementation of the Preferred Alternative identified in the DEIS for Chaves, Eddy, Lea and Roosevelt Counties would result in a "No Affect" situation for the Texas hornshell mussel.

Rationale:

- This species does not occur within the Planning Area. The known distribution of the Texas hornshell mussel is within the Pecos, Black and Delaware Rivers in New Mexico.

Cumulative Effects: Because the Preferred Alternative for Chaves, Eddy, Lea and Roosevelt Counties has a "No Affect" for the Texas hornshell mussel, there would be no increase in the existing or foreseeable future cumulative impacts within Chaves, Eddy, Lea and Roosevelt Counties for this species. The cumulative impacts presently existing (e.g., Federal, private, state activities) for this species would not change due to this action.

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United States Department of the Interior

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January 18, 2006

Cons. #22420-2007-TA-0033

Memorandum

To: District Manager, Pecos District, Bureau of Land Management

From: Field Supervisor, U.S. Fish and Wildlife Service, New Mexico Ecological Services Field Office, Albuquerque, New Mexico

Subject: Special Status Species Draft Resource Management Plan Amendment/Environmental Impact Statement (DRMPA/EIS)

Thank you for submitting your Draft Special Status Species Draft Resources Management Plan Amendment and Environmental Impact Statement (DRMPA/EIS) and Biological Assessment for the U.S. Fish and Wildlife Service's (Service) review pursuant to section 7 of the Endangered Species Act (Act) of 1973, as amended (16 U.S.C. § 1531 *et seq.*) and the Fish and Wildlife Coordination Act of 1977. The Bureau of Land Management (BLM) Pecos District Office has prepared the DRMPA/EIS to address management prescriptions for the protection and enhancement of special status species and their habitats (i.e., the lesser prairie-chicken (*Tympanuchus pallidicinctus*) (LPC) and the sand dune lizard (*Sceloporus arenicolus*) (SDL)) within BLM lands in Chaves, Eddy, Lea, and Roosevelt counties. This document was received by the Service on September 28, 2006.

The objective of the Preferred Alternative proposed by BLM is to modify existing uses (e.g., Federal minerals development, livestock grazing, recreation-off highway vehicles) occurring on public lands to protect special status species (LPC and SDL) while sustaining the local economy. This alternative uses an ecosystem-level approach and adopts the concepts of the New Mexico Lesser Prairie-Chicken/Sand Dune Lizard Working Group, *Collaborative Conservation Strategies for the Lesser Prairie-Chicken and Sand Dune Lizard in New Mexico*, (Strategy) published in August 2005, and adds measures designed to provide greater protection of LPC and SDL habitat.

We have reviewed the subject DRMPA/EIS and support the BLM's selection of Alternative B as the Preferred Alternative. If implemented as described in the DRMPA/EIS, we feel that these activities will provide protections to LPC and SDL in occupied and suitable habitats; reclaim abandoned well sites; improve potentially suitable habitats; and provide additional improvements to grazing lands within the planning area. All of these activities could benefit the LPC and/or SDL, as well as many other species within the planning area, and we commend the BLM for this proactive plan to improve

the status of these candidate species. Specific benefits of the Preferred Alternative are attached to this letter.

In addition to the DRMPA/EIS, the BLM provided a Biological Assessment (BA) for this action. Nancy Riley and Patricia Zenone, of my staff, discussed the BA with Vicki Herren, Threatened and Endangered Species State Lead, on January 17, 2007. Based on that discussion, we are providing the following comments as technical assistance regarding the actions proposed in this DRMPA/EIS to benefit LPC and SDL habitat and populations:

1. Describe clearly BLM's continued commitment to the collaborative conservation process of the New Mexico Lesser Prairie-Chicken/Sand Dune Lizard Implementation Working Group. The Federal agencies (e.g., BLM, Service, Natural Resources Conservation Service (NRCS)) continue to act as technical advisors to a group of State agency (e.g. New Mexico Department of Game and Fish (NMDGF), New Mexico State Land Office (NMSLO)), non-governmental organizations, industry, and private landowners working together to implement the Strategy. The Strategy and its implementation is an adaptive management process and any new species information, techniques, or restoration/reclamation methods provided through this collaboration should be incorporated into the RMPA.

2. Update the FEIS with all available information regarding LPC and SDL survey results on Federal and State lands. The Service has been told verbally that the NMSLO recorded additional leks during 2006 surveys and that BLM has information regarding additional locations of occupied SDL habitat. Update the FEIS with the NMDGF, *FINAL INVESTIGATION REPORT: The Lesser Prairie-Chicken in New Mexico*, February 2006. This report presents the results of six-year investigation of the LPC in New Mexico and concludes that listing the bird as a State-listed species is not warranted.

3. Update the FEIS with information demonstrating BLM's accomplishments in implementing portions of the Strategy's Conservation Strategy Pathways. Such as:
   a. **LPC Conservation Strategy - Pathway 1: Increase habitat quality and LPC recruitment on rangelands and CRP lands.**
      Include maps of sites surveyed using the Strategy's Standards for Vegetation (quality LPC habitat should have an average canopy cover of 30-50 percent grasses, 25-40 percent shrubs, and 3-10 percent forbs; with no more than 42 percent bare ground and litter) and Standards for Concealment Cover (at least 10 percent of all survey points should provide a Robel visual obstruction reading of at least 13 inches).

   b. **LPC Conservation Strategy - Pathway 3: Consolidate and expand network of reserves and other areas managed for LPC conservation. 3.4: Develop Candidate Conservation Agreements with Assurances (CCAA) to promote conservation efforts on state and private lands.**
      The Service has been in the process of developing a CCAA in Eddy Lea, and Chaves counties for over two years. The BLM has been a beneficial partner in this process although assurances cannot be given on Federal lands. The Service continues to coordinate with the BLM to provide Federal lessees and permittees with a mechanism

to address beneficial actions taken by the lessees and permittees on Federal lands should the LPC and/or SDL be federally listed as threatened or endangered.

c. **LPC Conservation Strategy - Pathway 5: Reduce other causes of disturbance and mortality.**
   i. Predation – Install bird roost prevention devices (e.g., Nix-Alite (a wire product used on structures to discourage birds from roosting)) on all wooden fence posts and other structures where able within 1.5 miles of known lek sites. This product is used to prevent raptor perching within the boundaries of the Attwater Prairie Chicken National Wildlife Refuge to enhance reproductive success (see attached photographs). Disabling perches in the vicinity of leks and prime nesting habitat should reduce predation by raptors in these sensitive areas.
   ii. Fence collision mortality – Consider the use of aluminum or latex house siding cut into short segments and affixed to barbed wire fences to reduce mortality of LPCs flying into fences. Fences can account for a significant portion of LPC mortality in some areas of their range.
   iii. Fence collision mortality – Since fence collisions can represent a large percentage of adult mortality, strong consideration should be given before constructing additional standard barbed-wire fences in occupied LPC habitat, especially for areas less than 640 acres in size. Temporary fencing around reclamation sites and rest/rotation pastures might be conducive to the use of two-strand electric fencing. This fencing is lower to the ground and less likely to be struck by LPCs flushing from a site.

d. **Chapter Five: Recommendations For Sand Dune Lizard Conservation**
   5.2 Landscape analysis and ongoing research – In occupied SDL habitat, strong consideration should be given to avoid any oil and gas industry practices that could impact the distribution and dispersal of SDLs. (e.g., trenches that could trap lizards moving from one area to another).

The Service appreciates the substantial amount of information and analysis contributed by BLM staff in preparing this comprehensive evaluation. We also commend the intent of the BLM to avoid adverse effects to candidate species, to protect and enhance grassland and shrubland habitats, and to provide benefits to other Federal trust species with this project.

In future communications regarding this memorandum or the proposed project, please refer to Consultation #22420-2007-TA-0033. If you have any questions concerning this memorandum, please contact Nancy D. Riley, of my staff, at (505) 761-4707.

Wally "J" Murphy
Field Supervisor

cc:
Threatened and Endangered Species State Lead, BLM State Office, Santa Fe, New Mexico
Director, New Mexico Department of Game and Fish, Santa Fe, New Mexico
Director, New Mexico Energy, Minerals, and Natural Resources Department, Forestry Division, Santa Fe, New Mexico

Actions described in the Preferred Alternative of this DRMPA/EIS that should provide benefits to the lesser prairie-chicken (LPC):

- Institute a more active land tenure program that would result from prioritizing exchanges with the NMSLO. Consolidation of public land would improve management efficiency and effectiveness, reduce management cost, and block up key areas to provide improved protection of resources.

- The Core Management Area (CMA) would be expanded to include the existing Mescalero Sands Area of Critical Environmental Concern (ACEC) as one contiguous block. The CMA would be closed to new oil and gas leasing, with certain limited exceptions.

- In State Game Commission-owned Prairie Chicken Areas, new leasing of Federal minerals, in most cases, would not be permitted.

- For existing leases, Plans of Development (POD) and appropriate Conditions of Approval (COA) would be required to ensure a minimum of surface impact in LPC habitat.

- PODs and COAs would specify various strategies for minimizing impacts associated with new development and for reclaiming developed areas for LPC and SDL habitat.

- Occupied and suitable LPC habitat in the Primary Population Area would be closed to new oil and gas leasing, with certain limited, case-by case exceptions.
    - Any new leases would require a No Surface Occupancy (NSO) stipulation be applied to the lease.

- If leasing and development of potentially suitable LPC habitat would impact suitable habitat, then these potentially suitable habitats would be closed to new oil and gas leasing.

- In the Sparse and Scattered Population Area (SSPA) occupied habitat (within 1.5 miles of a lek) would be closed to new leasing unless it is determined that the lease with an NSO would not impact suitable habitat.

- In the Isolated Population Area (IPA) occupied habitat (within 1.5 miles of a lek) would be closed to new leasing unless it is determined that the lease with an NSO would not impact suitable habitat.

- Within the IPA, no new mineral material sites will be authorized within 1.5 miles of an active lek.

- In the IPA, 17 areas are being evaluated for LPC suitability. These areas would be prioritized for reclamation potential and for potential to reestablish connectivity to adjacent isolated suitable habitat blocks. New oil and gas leasing is deferred on these areas until the habitat suitability analyses are complete.

- Within the Planning Area timing and noise stipulations will be applied. These stipulations are intended to prevent disruption of mating and nesting activities associated with energy exploration and development, and recreational activities.

- New power lines constructed within two miles of occupied LPC habitat would be buried to minimize LPC avoidance distances and avian predator perches.

- A power line removal credit program (PLRC) would be developed. Applicants for power lines would be required to remove 1.5 miles of idle power lines (wire and poles) within the CMA, PPA, SSPA, or IPA in occupied, suitable, or potentially suitable habitat before receiving authorization to construct 1.0 mile of new power line.

- Low profile tanks would be required in occupied LPC habitat to minimize LPC avoidance distances.

- The CMA and occupied habitat in the PPA would be designated right-of-way avoidance areas. Lands acquired as LPC and/or SDL habitat would be added to the right-of-way avoidance areas.

- Abandoned well pads, roads, and power lines in occupied, suitable, and potentially suitable habitats will be removed as funding allows. The areas will be replanted with native grass and shrub species.

- Invasive brush control will be applied to as much as 640,000 acres within the Planning Area. This will improve or restore LPC habitat directly in suitable or potentially habitat. It will benefit LPCs indirectly by improving range conditions in unsuitable LPC habitat for livestock grazing and provide rest to suitable and potentially suitable LPC habitat.

- Livestock grazing would be maintained at a level consistent with the seasonal nesting and brood-rearing habitat requirements of the LPC.

Actions described in the Preferred Alternative of this DRMPA/EIS that should provide benefits to the sand dune lizard (SDL):

- Tracts not currently under lease within SDL habitat would be closed to new oil and gas leasing until the BLM determines that development of tracts nominated for leasing can be developed without impacting dune complexes. Based on the determination, some tracts will remain closed, some developed with an NSO stipulation applied to the lease, and some developed with standard stipulations.

- Lands acquired as SDL and/or LPC habitat would be added to the right-of-way avoidance areas.

- For existing leases in SDL habitat, SDL surveys would be required prior to permitting surface disturbing activities and conducted by personnel approved by the BLM. Depending on the survey results, proposed well sites may or may not be developed. Existing leases

would require Plans of Development (POD) which incorporate the results of the SDL surveys. The POD would also incorporate applicable best management practices and disclose all future well locations; the location and arrangement of well infrastructure; road locations, and rights-of-way.

- Abandoned well pads, roads, and power lines in occupied SDL habitat will be removed and the areas reclaimed as funding allows. Areas with active dune complexes will not be replanted to benefit the SDL.

- New oil and gas well pads would not be placed in dune areas within occupied or suitable habitat, or within 200 meters of dune areas. Locating well pads exterior to dune areas would provide protection to SDL habitat.

- If shinnery oak is treated to improve vegetative composition for LPC, a 500-meter buffer will be applied around all occupied and suitable SDL habitat.

- Impacts associated with off-highway vehicle use would be decreased because available routes would be limited to designated roads and trails.

In addition to the special status species, the BLM has also included measures to benefit the northern aplomado falcon (*Falco femoralis septentrionalis*) (non-essential experimental population):

- Prior to initiating any projects during the raptor breeding season, the project area shall be surveyed for raptor nests. Surveys shall be conducted by individuals approved by the BLM. Specified time-of-year and disturbance distances have been incorporated into the DRMPA/EIS.

- Pre-project planning will ensure that the yucca component (large-branched specimens) within the Planning Area is not damaged or lost by protecting these yuccas from oil and gas activities (e.g., moving locations).

- Protection of lesser prairie-chicken and sand dune lizard habitats will ultimately help conserve grassland and other habitats within the Planning Area. These PODs and COAs would contain various strategies for minimizing impacts associated with new development and for reclaiming developed areas. These actions would be beneficial to any northern aplomado falcons which might move into the Planning Area.

- Within the Planning Area, coordinated efforts to reclaim and restore habitat in previously developed sites would be carried out when and where opportunities arise. These restored/reclaimed areas could be potentially suitable to the northern aplomado falcon.



Nixalite bird spikes installed on wooden fence posts at the Attwater Prairie Chicken NWR to decrease raptor predation on prairie chickens.



Appendix 11



APPENDIX 11
COMMENTS AND RESPONSES FROM THE DRAFT SPECIAL STATUS SPECIES RESOURCE MANAGEMENT PLAN AMENDMENT

INTRODUCTION

On October 20, 2006, BLM released for public comment the Draft Special Status Species Resource Management Plan Amendment (RMPA) and Environmental Impact Statement (EIS). The RMPA would amend the Roswell and Carlsbad Resource Management Plans with regards to habitat management for the lesser prairie-chicken and the sand dune lizard. The EIS analyzed alternative management strategies which could be employed as well as BLM's Preferred Alternative. The 90-day public review period closed on January 18, 2007.

TABLE 11-1 PUBLIC MEETINGS

MEETING DATE	LOCATION
November 9, 2006	Hobbs Public Library 509 North Shipp Street Hobbs, NM
November 16, 2006	Chaves County Commission Chambers 1 St. Mary's Place Roswell, NM
November 21, 2006	Carlsbad Public Library 101 South Halagueno Street Carlsbad, NM
November 28, 2006	Artesia Community Center 512 North 8th Street Artesia, NM
November 30, 2006	Midland Center 105 North Main Street Midland, TX

Notice of the public review period was published in the *Federal Register* on October 20, 2006, by the Environmental Protection Agency. The public was notified of the following dates and venues for public meetings through news releases as well as the BLM New Mexico and the Pecos District websites. The public meetings were held between the hours of 7:00 p.m. and 9:00 p.m. Public comments were received at these meetings and recorded by BLM staff.

PUBLIC COMMENT ANALYSIS

The 90-day public review period yielded five oral comments from the public meetings and 13 comment letters. The term "comment" is used to describe both letters received and the individual comments contained in those letters regarding particular issues or concerns. Thus, the 13 letters contained 110 different comments.

The Planning Team documented and analyzed public comments on the Draft EIS using a process called content analysis.

This process provides a systematic method of compiling and categorizing public viewpoints and concerns. Content analysis is intended to facilitate good decision-making by helping the Planning Team clarify, adjust, or incorporate technical information in preparing the Proposed RMPA/Final EIS.

TABLE 11-1 COMMENT LETTERS RECEIVED VIA E-MAIL AND POSTAL		
TRACKING NUMBER	**NAME**	**ORGANIZATION**
01	Lisa M. Meyer	New Mexico Department of Cultural Affairs, Historic Preservation Division
02	James B Montgomery, Jr.	
03		Chaves County Commissioners
04	Terry Z. Riley	Theodore Roosevelt Conservation Partnership
05	Robert J. Sandilos	Chevron Global Upstream
06	Victoria L. Sanchez	Devon Energy Production Company
07	Charles T. Pinson, Jr.	Central Valley Electric Cooperative, Inc.
08	Rand French	Marbob Energy Corporation
09	Armando Lopez	Yates Energy Corporation
10	Deborah Seligman	New Mexico Oil & Gas Association
11	Nicole J. Rosmarino	Forest Guardians
12	Gordon Yahney	
13	Lisa Kirkpatrick	New Mexico Department of Game and Fish

BLM's project management team leader reviewed the public comments and assigned appropriate staff to each public comment. Assigned staff evaluated the public comments, made revisions in the Proposed RMPA/Final EIS as appropriate, and prepared written responses to the public comments that are presented below. It is important for the public to understand that this process does not treat comments as votes and thus cannot sway decision makers toward the opinion of individuals, groups, or pluralities. Content analysis assures that every comment is considered with equal merit in the decision process.

Responses to public comments are provided below. In reviewing the public comments and responses, readers should note the following:

- To the extent that two or more public comments are the same or very similar, the comments are grouped together and addressed as one response.

- For public comments well beyond the geographic range of this plan and/or subjects not pertinent to this plan amendment, no response was prepared.

BLM attempted to address every public comment on all major subjects in this appendix. Redundant material was not included, thereby maintaining a manageable size to the Final EIS. A complete list of public comments is available from BLM by request.

The public comments that follow are grouped by Resource or Issue. The reader is encouraged to review all the groupings to fully understand public comments on particular subjects. The subject groupings are:

- Selection of the Preferred Alternative
- Planning and Management
- Lands & Realty
- Oil and Gas Leasing and Operations
- Soil, Water, Air, and Floodplains
- Vegetation
- Livestock Grazing
- Wildlife, including Special Status Species
- Cultural Resources
- Off-Highway Vehicles
- Socio-Economic Conditions

COMMENTS AND RESPONSES

SELECTION OF THE PREFERRED ALTERNATIVE

As stated previously in the Introduction, BLM received 13 comment letters during the 90-day public comment period for the Draft RMPA. Of these letters six favored Alternative A as its preferred alternative. Many of the comments listed concerns regarding the differences between Alternatives A and B. Rather than scatter those comments and responses through this section, BLM has compiled those comments here for clarification.

1. COMMENT: ***After all the time and effort spent in developing the Conservation Strategy, BLM's selection of Alternative B as the preferred alternative instead of Alternative A (the Working Group Conservation Strategy) undermines the spirit of collaborative planning.***

RESPONSE: BLM is very appreciative of the effort people invested in the Working Group and the Conservation Strategy developed by the Group. The concepts and ideas developed by the Group and incorporated into the Conservation Strategy are invaluable. BLM recognizes it would not have been able to move as quickly and efficiently through the planning process if the tremendous amount of work had not been completed by the Working Group.

BLM contends Alternatives A and B are significantly more alike than they are different. BLM believes the management prescriptions found in Alternative B (but not Alternative A) would ease implementation, reduce BLM's costs, and, perhaps most importantly, would still allow continued resource uses while protecting wildlife habitat.

2. COMMENT: ***The oil and gas industry gave significant acreage in the closed to leasing category from No Action to Alternative A. Now BLM is proposing to close more acres to leasing under the preferred alternative, Alternative B.***

RESPONSE: The increase in acreage closed to new oil and gas leasing (about 12,350 acres) can be accounted for in the larger Core Management Area (CMA) in Alternative B. Alternative A arrayed the CMA in three separate blocks. See Map A-1. The public land between the two southern blocks in Alternative A is designated as Sparse and Scattered Population Area (SSPA) and includes the Mescalero Sands Area of Critical Environmental Concern (ACEC).

The ACEC (7,888 acres of public land) was established by the 1997 Roswell RMP and at that time was closed to new oil and gas leasing. Additionally, the area between the two blocks of CMA is occupied chicken habitat, which under both Alternative A and Alternative B would be closed to new oil and gas leasing. Instead of having two separate management prescriptions with identical results (closed to new oil and gas leasing), BLM included this 4,462-acre area in the CMA of Alternative B. See the different CMA designations on Map A-1 and Map B-1.

3. COMMENT: ***On page 2-43, "Sand Dune Lizard - New Oil and Gas leasing, Tracts not currently under lease within the lizard habitat Boundary would be closed to leasing until..." This is a de facto no leasing***

statement within shinnery oak dune habitat, mesquite grasslands or other type of habitat until BLM can complete an evaluation. The green line encompasses a mosaic of vegetation types, some of which is not conducive to lizards/chickens. Leasing should still occur within all of these areas with industry understanding that avoidance of occupied habitat is necessary along with minimal disturbance in suitable habitats. We do not need surveys at the time of leasing, only at the time of POD or APD.

RESPONSE: Based on the comments received BLM has revised Alternative B, Sand Dune Lizard – New Oil and Gas Leasing, to more accurately portray its intent. It was not BLM's intent to portray the Sand Dune Lizard Habitat area, depicted by a green boundary line (see Map B-1), as contiguous occupied or suitable habitat. BLM understands the Sand Dune Lizard Habitat area contains many acres that could be developed for oil and gas without impacting occupied and suitable sand dune lizard habitat.

Under the revised management prescription, BLM would review any tract nominated for leasing for lizard habitat. Based on the results of the pre-lease review, BLM has four options:

- Withhold the tract from leasing until more information can be obtained; or
- Offer the tract for lease with appropriate portions containing a NSO stipulation; or
- Offer the tract for lease with a requirement that the lessee conduct a sand dune lizard occupancy survey, which after a review and approval by BLM, would result in appropriate Conditions of Approval to protect habitat; or
- Offer the tract for lease with standard leasing terms and conditions.

Under the first option, BLM cannot guarantee a date when additional information can be obtained and the tract offered for lease since this is dependent on BLM workload and funding. Under the second and third options lessees can request waivers, exceptions or modifications to their lease described in Chapter 2, Alternative B.

4. COMMENT: ***Alternative B prescribes no new well pads within 200 meters of dune areas. This prescription is too restrictive. Data collected by Sias and Snell (1996) supports that impact to sand dune lizards are greatly reduced when new oil/gas well pads are placed at least 100 meters away from occupies dune complexes while allowing oil and gas development to occur. The additional 100 meter protection area is excessive.***

RESPONSE: Sias and Snell (1996) state that 100 meters greatly reduces the impacts, however; the same report states: "a statistically significant pattern of greater numbers of sand dune lizards occurring at the Far plots (200-220 m from well pad) compared to the adjacent plots (10-30 m) and the Intermediate Plots (50-70 m)." BLM has the authority to move a prospective well location up to 200 meters and this prescription falls within that distance.

Alternative B proposes moving well locations up to 200 meters, which is a tool available to BLM (43 CFR 3101.1-2) that is used to minimize or eliminate impacts from well pad construction. Proposed well locations would only be moved the distance necessary to place the well and its infrastructure out of dune complexes.

The NSO requirement in dune complexes in Alternative B is BLM's attempt to focus habitat protection on a specific habitat type. BLM believes the NSO requirement for dune complexes, coupled with the process described in Response to Comment #3 should result in protection of occupied habitat, and allow for the expansion of lizard populations while allowing continued oil and gas development.

5. COMMENT: ***BLM dropped the possibility of having 13 pads per sq mile within the shinnery oak dune habitat from Alternative B. Industry is willing to avoid occupied habitat but in some large dune complexes (greater then 5 acres) there may be a need to develop on the edges of these habitats.***

RESPONSE: The New Mexico Department of Game and Fish study cited in the comments indicates that when development reaches 13 wells per square mile, the population of sand dune lizards drops approximately 25 percent. Within the US Fish and Wildlife Service, the lizard has a higher priority for potentiai listing as threatened or endangered than the chicken. In BLM's judgment, possible reduction in lizard populations by 25 percent is not consistent with the goal of preventing the lizard from being listed while allowing other activities to continue. BLM believes Alternative B establishes a process that allows development while protecting lizard habitat and, therefore, lizard populations.

By focusing on dune complexes BLM's intent is to apply protective measures only where necessary. By moving prospective well locations up to 200 meters, well pads and roads can avoid occupied and suitable habitat even in locations where the dune locations are greater than 5 acres in size. Working with the lessee through a plan of development BLM believes Alternative B establishes a process that allows development while protecting lizard habitat and, therefore, lizard populations while allowing development of a lease.

6. COMMENT: ***The mandatory removal of electric power lines can hinder future oil and gas development. A voluntary removal program would be better.***

RESPONSE: The text on page 2-41 of the Draft RMPA stated:

> "In order to provide opportunities for expansion of lesser prairie chicken habitat within the Planning Area and to reduce the impacts of electric power lines, applicants for electric power lines *would* participate in a power line removal credit (PLRC). Under this program applicants *would be required* to remove 1.5 miles of idle power lines (wire and poles) within prairie chicken habitat management unit (CMA, PPA, SSPA and IPA) and habitat type (occupied or suitable/potentially suitable) before receiving authorization to construct 1.0 mile of new power line."

This was an error, which has been corrected PRMPA/FEIS to state:

> "In order to provide opportunities for expansion of lesser prairie chicken habitat within the Planning Area and to reduce the impacts of electric power lines, applicants for electric power lines *could* participate in a power line removal credit (PLRC). Under this program applicants *could* remove 1.5 miles of idle power lines (wire and poles) within prairie chicken habitat management unit (CMA, PPA, SSPA and IPA) and habitat type (occupied or suitable/potentially suitable) before receiving authorization to construct 1.0 mile of new power line."

The power line removal credit program is one of six methods which could be used to reduce the impacts of power lines on lesser prairie chicken habitat.

7. COMMENT: ***Alternative B should include the provision for annually recalculating suitable habitat in the Primary Population Area (PPA).***

RESPONSE: Alternative A (the Conservation Strategy) had the following provisions in the PPA:

> *"New leasing in suitable habitat would be considered if, by annual re-calculation, there is demonstrated a net increase in the sum of suitable and occupied habitat in the PPA. New leasing in occupied habitat would be considered if the above criterion for suitable habitat is met, and there is a statistically significant lesser prairie-chicken population increase statewide over the previous five years."*

Alternative B has this provision in place of the Alternative A provision:

> "BLM would consider new oil and gas leasing in occupied and suitable habitat throughout the Planning Area at such time the lesser prairie chicken is no longer considered for listing as a threatened or endangered species."

Based on the comments received BLM has changed the text in Alternative B to state:

> "BLM would consider new leasing in suitable habitat within the Primary Population Area when there is a calculated two to one ratio of reclaimed acres to disturbed acres within the entire PPA and inter-agency coordination with the US Fish and Wildlife Service is conducted. The calculation would be conducted at five-year increments from the approval of this resource management plan amendment. In addition to meeting the two to one ratio, other considerations factoring into a decision for new leasing include, but are not limited to, the site characteristics of a tract nominated for leasing such as its proximity to occupied habitat, surface ownership, and the density of existing infrastructure.
>
> "BLM would consider new oil and gas leasing in occupied habitat within the PPA at such time the lesser prairie chicken is no longer considered for listing as a threatened or endangered species."

PLANNING AND MANAGEMENT

8. COMMENT: ***Why did Roosevelt County choose not to participate in the development of this RMPA?***

RESPONSE: BLM extended an invitation to the Roosevelt County Board of Commissioners to participate as a cooperating agency along with the boards of Chaves, Eddy and Lea Counties. Chaves, Eddy and Lea Counties elected to participate as cooperating agencies. The Roosevelt County Commissioners did not explain to BLM their reason or reasons for choosing not to obtain cooperating agency status.

9. COMMENT: ***While there is a chance that lesser prairie-chickens may be found outside of the planning area boundary, there is no need to apply management outside the***

Planning Area. BLM can move the 200 meters from a lek, but should not apply timing stipulations. This is a difficult work around for industry when the area or lek is not known.

RESPONSE: It is prudent for BLM to have management prescriptions in place outside the Planning Area in case an active lek is discovered involving public land and/or Federal minerals. For such situations BLM would apply the management prescriptions found in the existing land use plans (the 1997 Roswell RMP/Carlsbad RMPA, Appendix 1). The management prescriptions of this EIS would apply only within the Planning Area boundary

10. COMMENT: ***On page 2-27, left column, 2nd paragraph, why is the area open to leasing solid minerals? These activities cause more surface damages and disruption than oil and gas development.***

RESPONSE: The section cited in the comment is in the No Action Alternative which lists the current management prescriptions. The reason the Planning Area is currently open to the leasing of solid minerals is explained in the paragraph previous to the one cited, which states:

> *"Past history indicates public land in the Planning Area has never been mined for locatable minerals. While there have been claims staked in close proximity to the area to date, they have always proven to be purely speculative in nature. Numerous field examinations, geology, and mineral assays have indicated that there are likely no locatable minerals of commercial value in this area."*

One of the goals of this RMP Amendment is to change as few management prescriptions as possible. Given the low probability of leasing locatable mineral, BLM decided leaving the Planning Area open to locatable minerals was worth the risk.

11. COMMENT: ***"If a surface managing agency or surface owner has supplied to BLM and the operator with a reasonable written environmental requirement, the requirement would be incorporated into the APD . . ." The original text may lead to problems with all of the issues dealing with split estate. The requirement may be included once the oil and gas operator has been notified and negotiations have taken place with the surface owner.***

RESPONSE: BLM agrees and the text on pages 2-3 and 2-4 have been changed to reflect the requirement may be incorporated into the APD.

12. COMMENT: ***On page 2-18, 1st paragraph, suggest deleting surface disturbance "will not be allowed within 200 meters of playas and alkali lakes." In many cases wells could be located within this distance due to topography. BLM has the authority to move locations up to 200 meters, with on-site inspections defining site-specific surface water protection requirements.***

RESPONSE: The section cited in the comment is in the Management Common to All Alternatives section of Chapter 2. BLM has amended the text to read: "Surface disturbance would not be allowed within up to 200 meters of playas and alkali lakes." This sentence, as amended, is a direct quote from existing resource management plans and indicates that management around playas and alkali lakes would not be changed by this RMP Amendment.

13. COMMENT: ***Would the RMPA remain in effect if chicken and lizard numbers increase to the point of no longer needing listed status?***

RESPONSE: The Draft RMPA/EIS contains the management prescriptions and flexibility to deal with the situation should the status of one or both species be down graded. Should that event occur, Alternatives A and B state that some management prescriptions would remain in place to preclude a return of either species to the status of candidate for listing as threatened or endangered.

14. COMMENT: ***The preferred alternative would open 818,000 acres to new leasing, which constitutes 71% of the total BLM-managed surface and subsurface lands in the planning area.***

RESPONSE: Currently 72 percent of the Federal minerals within the Planning Area are leased for oil and gas exploration and development. Under current management plans, nearly all Federal minerals within the Planning Area, 1.145 million acres, are open for new oil and gas leasing. Alternative B, the preferred alternative, proposes to reduce the amount of Federal minerals open to new oil and gas leasing by 221,000 acres.

15. COMMENT: ***We are alarmed BLM is proposing leasing Federal minerals in the State Game Commission-owned Prairie Chicken Areas and proposing no surface occupancy requirements to mitigate this breach [in Alternative A].***

RESPONSE: Under the current land use plans, the Federal minerals beneath the Prairie Chicken Areas (PCAs) are open to leasing. Both Alternative A and Alternative B propose to close the PCAs to new Federal oil and gas leasing. The text in Alternative A (which also applies to Alternative B) states:

> *Federal minerals within the State Game Commission-owned Prairie Chicken Area would be closed to new oil and gas leasing. For pooling purposes or drainage protection, new leasing with a NSO stipulation may be allowed within a Prairie Chicken Area provided exploration and development does not impact suitable habitat.*

For pooling and drainage purposes, BLM would issue a new lease if, production from an adjacent lease or leases are draining the minerals under the tract and, with a no surface occupancy requirement, no additional surface disturbance would occur. This situation could occur in and around the PCAs (see Map B-5a). Buyers of these types of leases generally own the surrounding leases and realize no new surface disturbance would be approved in the PCAs.

16. COMMENT: ***In Alternative A, the State Game Commission-owned Prairie Chicken Areas would be closed to new oil and gas leasing but the PCAs do not appear to be closed to new leasing in Alternative B.***

RESPONSE: The Fluid Minerals section of Alternative B begins with the following phrase:

> *"Alternative B is similar to Alternative A with the following differences:"*

The Fluid Minerals section of Alternative B then describes the management prescriptions found in this alternative but not Alternative A. This section does not describe a management prescription in which the Federal minerals would remain open to new leasing in the PCAs.

Therefore, the PCAs are closed to new leasing in Alternative B. Also, see the Response to the previous Comment.

17. COMMENT: ***The 75-decibel limitation on pumpjack motors is insufficient. Please consider the Farmington Field Office has established noise limits of 48 decibels.***

RESPONSE: The Farmington Field Office set the 48-decibel limit to deal with noise around human habitation, visitor use areas, camp or picnic areas, and recreation trails. The limit is prescribed within 100 feet of homes and 400 feet from noise sensitive areas. Noise is unlimited outside this prescription within the Farmington Field Office. By contrast the 75 db restriction is to be applied throughout the Planning Area and not just around noise sensitive areas.

18. COMMENT: ***We suggest BLM consider an alternative that includes the Primary Population Area in the Core Management Area and close the combined area to new oil and gas leasing.***

RESPONSE: BLM has analyzed this scenario under Alternative C. Alternative C, Zone 1 includes the acreages for the Core Management Area and Primary Population Area, and would be closed to new oil and gas leasing.

19. COMMENT: ***BLM should include consideration of Areas of Critical Environmental Concern (ACECs) as a subset of a broader conservation alternative which also considers the habitat needs of the sand dune lizard, other special status species and covers all of the Planning Area. None of the other alternatives besides Alternative E considers any new ACECs or special management areas.***

RESPONSE: Other than the proposed ACEC analyzed in Alternative E, BLM received no nominations for ACECs, either from external sources or internal sources. As required by BLM planning regulations, BLM analyzed the impacts that might result from the ACEC designation in at least one alternative. The reasons for not designating the ACEC are found in Chapter 4. See pages 4-67 and 4-68 of the FEIS.

20. COMMENT: ***The DEIS must address all special status species including but not limited to black-tailed prairie dog, swift fox, mountain plover, burrowing owl, Bell's vireo, gray vireo, ferruginous hawk, loggerhead shrike, Texas horned lizard, northern aplomado falcon and bald eagle.***

RESPONSE: BLM manages northern aplomado falcon habitat as if the species was designated "Proposed" species and is not required to consult or confer with the US Fish and Wildlife Service unless BLM's analysis results in a "may affect – likely to adversely affect" determination. A determination of "may affect – not likely to adversely affect" was made because the Planning Area is not in the historic range of the falcon. The bald eagle is not known to occur within the Planning Area. See Appendix 10 for the Biological Assessment and the Service's response.

The other special status species were addressed in the 1997 Roswell RMP/Carlsbad RMPA which cover the Planning Area and are thus incorporated.

21. COMMENT: ***BLM has a duty under the Endangered Species Act to conserve threatened and endangered species, including the northern aplomado falcon and bald eagle. BLM should disclose what conservation measures will be implemented to recover these species.***

RESPONSE: See the Response to the previous Comment.

22. COMMENT: ***BLM claims that it cannot refuse development of existing leases because "holders of existing oil and gas lease have valid rights for development of their leases." See the DEIS at pages S-2 and 2-60. This contradicts a claim BLM made in Federal Court that it could at any time refuse an application for permit to drill if environmental conditions warranted it. The sand dune lizard is a candidate for listing under the Endangered Species Act and oil and gas development is a known, significant threat to this species. Denial of new wells and leases is clearly warranted in and near the occupied and suitable habitat of special status species.***

RESPONSE: BLM does not believe the statement quoted in this comment contradicts BLM testimony in Federal Court. As BLM argued in Federal Court, lessees have development rights but not absolute guarantees that their leases can be developed. A lessee has the right to use the leased tract subject to three things:

- Lease stipulations,
- Nondiscretionary statutes such as the Endangered Species Act or the National Historic Preservation Act, and
- Such reasonable measures as may be required by BLM to minimize adverse impacts to other resource values, land leases, or users, not addressed in the lease stipulations.

BLM controls surface disturbance on public land and can withhold approval of prospective well locations on existing leases. Prospective well locations are described in APDs and BLM routinely works with lessees to move prospective well locations to sites that minimize environmental impact prior to APD approval. In the rare situations when these negotiations reach an impasse, BLM can deny the APD.

The commenter appears to want BLM to treat the sand dune lizard as a species listed under ESA, but it remains a candidate species which is not eligible for full protection under ESA. Therefore, protection of sand dune lizard habitat is not a legal matter but a matter handled under BLM policy.

It is BLM's policy to manage public land and resources in such a manner so that it is not necessary to list the sand dune lizard. The purpose of this resource management plan amendment (RMPA) is to put into place management prescriptions that would avoid the necessity of listing either the sand dune lizard or the lesser prairie-chicken while allowing existing activities on public land to continue. BLM believes the implementation of this RMPA will accomplish this purpose.

23. COMMENT: ***Burying of electric power lines is a safety issue in sandy soils where wind erosion may expose these lines.***

RESPONSE: BLM is aware of the safety concerns, which is why burying power lines is an option for reducing habitat impacts, not a requirement. See the amended text on page 2-41.

24. COMMENT: ***Why would a buried power line be no closer than two miles (measured from a lek) in occupied habitat and buried in all suitable habitat when there are no structures?***

RESPONSE: Most lesser prairie-chicken nesting and brood rearing occurs within 1.5 miles of a lek. This 1.5 mile radius around an active lek is occupied habitat and defined on page 51 of Appendix 2. The purpose of the prescriptions in this plan is to minimize activities within occupied habitat. The Robel disturbance distance for overhead electric power lines is .25 miles. An overhead line may be 1.5 miles from an active lek but the disturbance distance intrudes .25 miles into occupied habitat. BLM rounded off the distance from 1.75 miles from an active lek to 2.0 miles from an active lek for ease of administration. If an operator or his contractor proposes an electric power line within 2 miles of an active lek, one option would be to bury the power line. Alternative options for power line locations, as listed in the RMPA, may be feasible and would be evaluated in consultation with the proponent.

Suitable habitat is defined on page 51 of Appendix 2. Authorizing overhead lines in suitable habitat would likely lead to the reclassification of an area as potentially suitable or unsuitable habitat. BLM has amended the text to clarify that power lines could be buried in suitable when the power line location is within 2 miles of an active lek.

25. COMMENT: ***For existing power poles, apparatus could be installed that will dissuade raptors from perching on the poles. If necessary, colored balls could be installed on the power lines to improve visibility of the lines to minimize power line collisions.***

RESPONSE: Chickens avoid tall structures, including power poles, and the presence of power lines contributes to chicken habitat fragmentation. Raptor perching on power poles and collisions with the lines are only part of the fragmentation problem. Overhead power lines present an avoidance area of 0.25 mile on either side of the line that chickens avoid using. In the event power lines are removed and chickens reoccupy the area, if a power line is needed in that specific area in the future, BLM would consult with the applicant for the power line in order to avoid detrimental impacts to chicken habitat.

26. COMMENT: ***When discussing power lines to be removed under the Power Line Removal Credit Program, we suggest using a common term throughout the document.***

RESPONSE: BLM agrees. The electric cooperatives use the term “idle” for power lines not being used and the text has been changed to use this common term.

27. **COMMENT:** ***There are no provisions to receive a permit to construct a new power line should all idle lines be removed sometime in the future. What would be the procedure to obtain authorization to build a new power line?***

RESPONSE: Participation in the Power Line Removal Credit (PLRC) program is voluntary and the text in the document has been change to reflect the option of removing idle power lines. The Preferred Alternative describes other methods of supplying electric power to well sites while reducing habitat fragmentation and a right-of-way applicant could be authorized to use any one of these methods in the event that all idle lines have been removed and all "banked" power line removal has been used.

28. **COMMENT:** ***In regard to the PLRC, we agree that should we desire to build a power line in the Core Management Area, the Primary Population Area and the Habitat Evaluation Areas within the Isolated Population Area, the ratio of removing 1.5 miles of idle power line for the construction of one (1) mile of new line is a reasonable exchange; but, we believe where the Lesser Prairie Chicken is not present, we should not have to remove power lines before constructing a new line in this area. We feel that it is unfair and unreasonable to require companies to remove power line in order to construct new line within areas the BLM has classified as uninhabited areas.***

RESPONSE: The intent of the PLRC is to provide incentives to remove idle power lines in high priority habitat areas described in Appendix 6 and focuses on occupied and suitable lesser prairie-chicken habitat. A right-of-way applicant may elect to participate in the PLRC program but there is no requirement to do so. BLM does not foresee a situation in which a right-of-way applicant would be required to remove idle power lines in unsuitable habitat. The Isolated Population Area (IPA) was included in the PLRC in order to provide management direction should occupied lesser prairie-chicken habitat be confirmed in the future. Recent occupancy surveys have sighted chickens in the IPA but active leks have yet to be confirmed.

29. **COMMENT:** ***On page 2-12 the text infers that all pipelines 10 inches or larger must be placed in major rights-of-way corridors identified on Map U-1. Some transportation pipelines within the oil field are larger than 10 inches.***

RESPONSE: Based on this comments BLM has changed the text to refer to interstate utility corridors. The intent of designating these corridors is to comply with the Energy Policy Act of 2005.

30. **COMMENT:** ***A 3,800-foot wide interstate utility corridor is extremely large and could have significant impact to these species in the form of a major barrier.***

RESPONSE: Congress directed BLM and the US Forest Service to develop this EIS in accordance with Energy Policy Act of 2005. This comment will be forwarded to the team developing the WWEC PEIS. An important point for readers to remember is the designation of interstate utility corridors applies only to those locations on public land. The 3,800-foot distance is an error and the correct distance is 3,500 feet. The width of 3,500 feet was selected in the West-Wide Energy Corridor Programmatic Environmental Impact Statement to allow for multiple energy transmission facilities and the text has been changed to indicate that distance. This distance

represents the largest width these corridors would occupy, however, they could be narrower to accommodate other issues and concerns.

The impacts associated with these corridors were analyzed in Chapter 4 of the Special Status Species RMPA/EIS. The corridors depicted on Map U-1 that cross the Planning Area follow existing pipelines and are designated as pipeline only.

31. COMMENT: ***In Alternative B, BLM states that no new surface disturbance associated with rights-of-way would be allowed in dune complexes within the sand dune lizard habitat area (see Map B-1). Instead of "dune complexes", the text should be change to "within occupied sand dune lizard habitat." Those that do not know the area will think that everything inside the green line on Map B-1 is sand dune lizard habitat.***

RESPONSE: BLM understands the Sand Dune Lizard Habitat area contains many acres that could be developed for oil and gas without impacting occupied and suitable sand dune lizard habitat. It was not BLM's intent to portray the Sand Dune Lizard Habitat area depicted by the green line on Map B-1 as contiguous occupied or suitable habitat.

The intent of Alternative B is to provide more sand dune lizard habitat protection than the other alternatives and allow opportunities for expansion of sand dune lizard populations from occupied habitat into suitable habitat. The suggested text change would not allow opportunities for lizard populations to expand into suitable habitat. The text goes on to state exceptions to this requirement would be considered on a case-by-case basis on the proposed surface use and proposed mitigations indicating the proposal would not adversely affect the local lizard population. BLM would consider these uses in lizard habitat (i.e. pipelines) if it is thought that the potential occurs to assist in dispersal corridors for lizards.

OIL AND GAS LEASING AND OPERATIONS

32. COMMENT: ***Various alternatives put forth by the BLM call for the submittal of a plan of development (POD) at the time of lease award. Such PODs would be the end product of proprietary industry processes and the public release of such information would give improper knowledge/advantage to a company's competitors. Instead the BLM should in its process assume that the entire lease is going to be developed on the smallest regulated spacing (40 acres).***

RESPONSE: Chapter 2 contains the following statement: "Plans of Development (POD) may contain proprietary information which would prohibit its disclosure under the Freedom of Information Act." This statement is common to all alternatives.

Plans of Developments (PODs) are used to ensure the orderly development of the entire lease. PODs include the number and placement of roads, pads, power lines and other facilities used for exploration and development of resources for the entire lease, which may or may not include drilling every 40 acre spacing unit within the lease. By working together to develop a POD, the lessee and BLM will be able to minimize conflicts between mineral development and other resources.

33. COMMENT: ***Deviated drilling is not necessarily the best solution to***

always avoid resource conflicts. This application is limited in use and will significantly increase the cost and surface impacts.

RESPONSE: To meet the objectives of the Resource Management Plan Amendment, some lands within the Planning Area are protected from surface impacts. This protection would restrict or deny direct (vertical) drilling and the associated surface use of some lands within the Planning Area. Directional (deviated) drilling is an exploration and development tool for lands that are within protected habitat.

34. COMMENT: ***On page 2-13 right hand column third paragraph last sentence "If the use of plastic pipe is approved, the pipe must meet American Petroleum Institute specification". We suggest rewriting the sentence to say that if plastic pipe is approved the manufacturers specification rating of the pipe must meet the intended use of the pipe (pressure, temperature, etc).***

RESPONSE: Based on the comments received BLM has revised the text as follows: *"If the use of plastic pipe is approved, the pipe must meet American Petroleum Institute specifications or equivalent standard specifications and intended use from pipe manufacturer."*

35. COMMENT: ***Page 2-21 right hand column last paragraph The CMA in its entirety and occupied lesser prairie chicken habitat in the PPA, SSPA, and IPA would be closed to new leasing of Federal Minerals until such time that the special status species are not considered for listing as a threatened or endangered species". This will probably never happen. We ask that BLM consider rewriting the sentence to allow leasing in the SSPA and IPA areas with a NSO stipulation.***
RESPONSE: BLM has already included the management flexibility requested by this comment. Page 2-21 starts the General Description of Alternatives and details of the alternatives follow later in the chapter. Page 2-21 states the following: "Where deemed appropriate, exceptions to no new leasing may be allowed if habitat studies show drilling and exploration would not impact lesser prairie-chicken and/or sand dune lizard habitats and to avoid potential drainage situations."

On page 2-33, the requirements for new leasing in the SSPA and the IPA include: "New leasing with a NSO requirement may be allowed, where this is determined to be appropriate, i.e., pooling or drainage protection that does not impact suitable habitat."

36. COMMENT: ***On page 2-42 middle of page "Unitization may be required on new leases in the Planning Area to ensure protection of special status species habitat as allowed by lease notice." Unitization may not be appropriate in the planning area for new leases as there are probably not any large blocks of unleased lands that would lend themselves to unitization.***

RESPONSE: Unitization is an option that would provide for the orderly development of lands included within several federal leases and adjacent state and private lands. Unitization would also provide protection from drainage of federal mineral resources. Based on comments received BLM has revised this sentence to state: "Unitization may be utilized on new leases in the Planning Area to ensure protection of special status species habitat; as allowed by lease notices."

37. COMMENT: ***On page 2-14, 1st Para – 2nd sentence, we suggest deleting references to reserve pits. Reserve pits are temporary and are closed once fluids have been removed, dried and then the pits are closed.***

RESPONSE: Based on comments received BLM has revised this section to more accurately portray its intent. The sentence now states: "Regulation of pits falls under the jurisdiction of the New Mexico Oil Conservation Division. Open-top tanks, disposal pits, or other open pits would be required to be covered with a fine mesh netting to make them inaccessible to birds, bats and other wildlife."

38. COMMENT: ***The DEIS estimates direct impacts on 4,900 acres of habitat and indirect impacts on 123,480 acres of habitat over the life of the 20-year plan. See DEIS at pp. 4-38 to 4-39. The DEIS also acknowledges that reclamation is very slow. It is therefore difficult to ascertain how this plan would prevent the sand dune lizard and lesser prairie-chicken being listed as threatened or endangered.***

RESPONSE: Approximately 72 percent of the Federal minerals in the Planning Area are already leased. Furthermore, a large percentage of the leased lands are held by production. Most of the estimated impacts would occur on lands that are already impacted (see Map 2-2)

BLM will use all available procedures and methods to minimize the impacts of development though the use of COAs, BMPs, and PODs. Included in these BMPs are practices that include minimizing the size of well pads, using interim reclamation during the life of the well, reducing the size and number of roads, reclaiming lands at a 2 to 1 ratio and utilizing proactive restoration programs.

39. COMMENT: ***The designation of a Core Management Area (CMA) appears to be temporary and subject to exceptions. See DEIS at p.2-21 to 22. In addition, the 17 Habitat Evaluation Areas will be closed to new leasing only until the completion of an evaluation to determine whether they should remain closed or be opened.***

RESPONSE: Page 2-21 starts a general description of alternatives and details of the alternatives follow later in the chapter. Under the preferred alternative, the Core Management Area is closed to new leasing until the special status species are no longer warranted for listing. If new leasing is considered, conditions would be attached that would preclude listing the special status species as threatened or endangered. Where deemed appropriate, exceptions to no new leasing may be allowed if habitat studies show drilling and exploration would not impact habitat and to avoid potential drainage situations.

The 17 Habitat Evaluation Areas within the IPA would be closed to new oil and gas leasing until these areas can be evaluated. The evaluation is to determine suitability for habitation by the special status species. Depending on the results, unleased tracts would be either leased or remain closed to new leasing.

40. COMMENT: ***It is unclear whether these lands (CMA and Habitat Evaluation Areas) are included in the 221,456 acres characterized as closed to oil and gas leasing in Table 2-1. See DEIS at p. 2-23. The DEIS therefore fails to disclose which, or how much, of these evaluation areas and how much total acreage in the planning area will be open to leasing.***

Thus the public cannot ascertain the full environmental consequences of the proposed alternative.

RESPONSE: Table 2-6 shows acres of leased and unleased lands in the planning area under the preferred alternative. Currently, there are 319,997 acres of unleased Federal minerals in the planning area, of which 221,456 acres would be closed to new leasing. The remaining 98,521 acres of currently unleased Federal minerals would be available for new leasing in the Planning Area. This does not include unleased lands within the 17 Habitat evaluation areas.

41. COMMENT: ***We urge the closure of more areas to new leasing, particularly given that large proportions of the CMA (74%) and the Primary Population Area (47%) are currently unleased. See DEIS at p.2-31. This is particularly important given that it is unlikely that in some instances even No Surface Occupancy (NSO) stipulations will not be sufficient to eliminate the impacts of oil and gas activities on special status species.***

RESPONSE: Under the preferred alternative, 69 percent of the available unleased lands in the Planning Area would be closed to new leasing. This includes all unleased acreage in occupied habitat throughout the planning area and the unleased acreage of suitable habitat in the Core Management Area and Primary Population Area. BLM believes this unleased acreage, coupled with the lease stipulations proposed by this DEIS sufficient to meet the goals and objectives of this plan. The USFWS in their letter dated January 18, 2007 (reference Cons. #22420-2007-TA-0033, see Appendix 10) stated the following:

We have reviewed the subject DRMPA/EIS and support the BLM's selection of Alternative B as the Preferred Alternative. If implemented as described in the DRMPA/EIS, we feel that these activities will provide protections to LPC and SDL in occupied and suitable habitats; reclaim abandoned well sites; improve potentially suitable habitats; and provide additional improvements to grazing lands within the planning area. All of these activities could benefit the LPC and/or SDL, as well as many other species within the planning area, and we commend the BLM for this proactive plan to improve the status of these candidate species.

42. COMMENT: ***The proposed alternative also allows development 200 meters from existing leks (See DEIS at p. 2-63), despite the inadequacy of this buffer from preventing disturbance to lesser prairie-chickens.***

RESPONSE: The table at page 2-63 is a summary table and is not intended to list all details regarding habitat protection. The 200 meter buffer is extrapolated from the Table 2-4, Robel Impact Distances. The 200 meter buffer is used in conjunction with the timing and noise stipulation to protect active leks.

43. COMMENT: ***On page 2-35, 3rd bullet, BLM needs to allow for flexibility in the reclamation process. As a result of reclamation, advancing technology, and species monitoring, the practice of removing caliche surfacing may not be needed in the future.***

RESPONSE: BLM agrees flexibility and monitoring is necessary in reclamation practices within the Planning Area. BLM also acknowledges the best management practices will change over time as experience accumulates. Removing caliche from abandoned oilfield roads and well pads, however, will likely be a feature of reclamation for some time. BLM has monitoring data and photographs of caliche roads and pads that were ripped and seeded 15 to 20 years ago. The areas treated in this manner still do not support Desired Plant Community vegetation.

44. COMMENT: ***Operators should receive acreage credits for reclaiming or enhancing suitable habitat and then benefit from fewer stipulations or conditions (reducing the no-drilling time periods, reduce the distance for occupied or suitable habitat) of approval for creating enhancing, or reclaiming suitable habitat.***

RESPONSE: Lessees are responsible for reclamation under the standard terms of their lease. Reducing the number of lease stipulations or conditions of approval, or reducing the restrictions on industry operations as suggested by the comment would be counter productive to the management goals of both Alternative A and Alternative B.

45. COMMENT: On page 2-35, ***BLM should not close the entire Core Management Area to the sale of mineral materials. Not all the acres within the CMA are chicken habitat and there should be opportunities to use the gravelly soils for development of existing oil and gas leases within the CMA.***

RESPONSE: Based on the comments received BLM has changed the text to state: "In the CMA no new mineral material sites would be authorized in occupied or suitable prairie-chicken habitat."

46. COMMENT: ***On page 2-34, under IPA Existing leases, we suggest inserting "based upon habitat condition" when plans of development (PODs) are requested.***

RESPONSE: Within the Planning Area there would be numerous reasons for BLM to request a POD in addition to habitat conditions. Rather than burden the text with lists of conditions or a combination of conditions that might lead to request for a POD, BLM has chosen to leave the text unchanged.

47. COMMENT: ***On pages 2-32 and 2-33, Primary Population Area – New Oil and Gas Leasing discusses lands closed to oil and gas leasing and that BLM would determine if habitat is suitable or unsuitable prior to issuing a new oil and gas lease. No timeframe are given for doing the determination. We would ask that BLM consider that these lands be open to leasing with a buyer beware stipulation or NSO stipulation attached to the lease that would not guarantee there would be any well locations within the lease.***

RESPONSE: Occupied, suitable, potentially suitable and unsuitable habitat in the Primary Population Area has already been determined and mapped. See Map B-5 and Map B-5A. When and under what conditions BLM would allow new leasing in occupied and suitable habitat within the PPA are specified in Alternative A and Alternative B.

48. COMMENT: ***We recommend directional drilling requirements on existing leases in lizard or chicken habitat or denial of new well permits when directional drilling will not sufficiently eliminate adverse impacts.***

RESPONSE: To meet the objectives of the Resource Management Plan Amendment, some lands within the Planning Area are protected from surface impacts. This protection restricts or denies direct (vertical) drilling and the associated surface use of some lands within the Planning Area. Directional (deviated) drilling is an exploration and development tool for lands that are within protected habitat. See also the Response to Comment #22.

49. COMMENT: ***There should be no further energy developments on this vegetation type until lesser prairie chicken populations have had a chance to recover. Recovery should be defined as enough population that can sustain itself and the habitat can be considered suitable and occupied for management reasons.***

RESPONSE: Approximately 72 percent of the Federal mineral acreage in the Planning Area is held by existing mineral leases. Stipulations and conditions of approval are used to protect occupied and suitable habitat on these leases throughout the planning area. Approximately 69 percent of the available unleased Federal mineral acreage in the Planning Area would be closed to new leasing. The remaining 31 percent of the unleased Federal mineral acreage is primarily unsuitable habitat.

50. COMMENT: ***We recommend that new energy developments be allowed to proceed at a 1 to 1 ratio of unsuitable lesser prairie chicken habitat developed to disturbed suitable habitat reclaimed.***

RESPONSE: Best Management Practices (BMPs) are used throughout the planning area. One goal of the BMPs is to reclaim or restore habitat at a 2 to 1 ratio throughout the planning area. Included in the BMPs are practices and processes that minimize surface impacts from mineral exploration and development. An important component of the BMPs is active reclamation of a site while the facility is in use, followed by restoration of the site once the facility becomes inactive.

BLM does not have the authority to require reclamation of a site or facility for which the operator is not responsible. There are other administrative procedures (bonds, cooperative agreements, etc.) that may be established to achieve a 1 to 1 ratio of reclaimed habitat in the Planning Area.

51. COMMENT: ***Stipulated energy leasing should be allowed such that the future energy development footprint in the area on lands administered by the BLM will not exceed the existing development footprint.***

RESPONSE: Best Management Practices (BMPs) shown in Appendix 5 are used throughout the planning area to minimize surface impacts from mineral exploration and development. The BMPs include such practices as minimizing well size pad and reducing the number of roads used to access facilities. Where required to protect habitat, a No Surface Occupancy stipulation is attached to new leases.

52. COMMENT: ***BLM should require that roads needed for energy exploration and development to be built only to a standard that results in fewest impacts on lesser prairie chicken habitat.***

RESPONSE: Best Management Practices are used throughout the planning area to minimize impacts to habitat. Among the practices used are reducing the number of roads, building the shortest roads possible and utilizing existing road networks. BMPs also select road routes that would create less overall surface disturbance. Road surfacing should be limited to soils and topography that require additional surfacing to reduce soil erosion. As a general rule, if roads require surfacing, then the minimum compacted layer of surface material should be applied. It is BLM's goal to have the minimum road built that safely meets access objectives.

SOIL, WATER, AIR, AND FLOODPLAINS

53. COMMENT: ***We are concerned about impacts from noxious emissions and greenhouse gases from oil and gas and livestock grazing on special status species, along with contributions from those sources to the climate crisis. The DEIS fails to address these concerns. See DEIS at p. 2-64.***

RESPONSE: The discussion of impacts to air quality by these activities is found in Chapter 4 (see page 4-8 of Proposed RMPA/Final EIS). BLM is in compliance with national and State air quality standards and will cooperate with the State of New Mexico in carrying out its implementation plans. Currently, there are no regulations applicable to climate change, although there is much discussion regarding potential carbon emissions.

54. COMMENT: ***There are concerns with using the words preventing or avoiding in the following sentence: "BLM's soil and watershed program places emphasis on preventing or avoiding further degradation of soil and water resources, as well as their conservation." We suggest substituting "minimizing" in the place of "preventing or avoiding."***

RESPONSE: The use of the phrase "prevent or avoid" is based on existing BLM Manuals 7000 and 7200 as well as program guidance. The 1997 Roswell RMP/Carlsbad RMPA uses this phrase and since this DEIS proposed no changes in management prescriptions, the prescriptions found in those RMPs for both soils and watershed were carried forward.

55. COMMENT: ***On page 3-5, Under Water Resources, please cite the source for the impacts to ground water.***

RESPONSE: The New Mexico Oil Conservation Division's (NMOCD) Generalized Record of Ground Water Impact Sites report (September 30, 2005) lists active and inactive sites regulated by the NMOCD, Environmental Bureau, that are known to have groundwater that has been contaminated from leaks, spills, and releases of oilfield wastes or products which occur in the area.

56. COMMENT: ***On page 4-3 discusses degradation of surface water and impairment of floodplains due to oil and gas development. What impacts on these resources by other uses of public land?***

RESPONSE: Based on this comment the text was changed to state: "*Surface disturbance in the Planning Area can result in degradation of surface water quality and groundwater quality from non-point source pollution, increased soil losses, and increased gully erosion*" and "*Surface disturbance in the Planning Area can result in impairment of the floodplain values from removal of vegetation, removal of wildlife habitat, impairment of water quality, decreased flood water retention, and decreased groundwater recharge.*"

VEGETATION

57. COMMENT: ***Page 2-47 mentions targeting various areas for treatment to enhance habitat. This is fine as long as development is not restricted just in case the BLM has plans to hopefully improve unsuitable to suitable habitat. This could take many years and is a big unknown.***

RESPONSE: This paragraph reiterates that Alternative B will focus on special status species habitat enhancement throughout the Planning Area, not just in suitable or occupied areas. Habitat enhancement will be considered throughout the Planning Area, if such treatments can improve the habitat. After careful consideration of site potential and treatment type, a project may be implemented to carry out the objectives of this plan. BLM does not foresee any restriction to development in areas that may be treated sometime in the future.

58. COMMENT: ***There are concerns with focusing on herbicide use, failure to acknowledge adverse environmental impacts of the use of herbicides, and failing to consider other methods of vegetation treatment.***

RESPONSE: While a portion of the DEIS discussed herbicide use, it does not focus on herbicides as the only tool for vegetation treatment. Instead, treatment with herbicides is recommended only when habitat goals cannot be achieved by other means and treatment is recommended when necessary to achieve vegetative standards (see page 2-36). BLM uses chemical treatment when brush invasion has reached the point that techniques such as long term rest, mechanical control, or prescribed fire are not effective. Toxicity concerns and long term adverse impacts have been analyzed in the Vegetation Treatment on BLM Lands in Thirteen Western States EIS and site specific EAs, and impacts are mitigated using proper application rates and methods.

59. COMMENT: ***On page 2-48, it is stated that Shinnery oak treatments would follow guidelines described under Alternative A, with one exception. The requirement that dispersal corridors of untreated shinnery oak flats at least 500 meters wide should be retained between suitable habitats, both occupied and unoccupied, that are separated by less than 200 meters, would be dropped. We believe this would be detrimental to the conservation and persistence of the sand dune lizard and lesser prairie-chicken in the planning area and therefore the state. In addition, we feel the DEIS could be considered misleading in that the above proposal appears only once on page 2-48 and is not identified elsewhere.***

RESPONSE: BLM agrees that these dispersal corridors are important to the recovery of the sand dune lizard and as

such need to be protected. Therefore, the statement relative to retaining sand dune lizard dispersal corridors will be changed in Alternative A to read less than 2000 meters and the paragraph saying this will be dropped will be removed from Alternative B. Alternative B will now mirror the guidelines for chemical control of shinnery oak outlined in Alternative A.

60. COMMENT: ***Research has shown that treatment of shinnery oak with herbicides has not been beneficial to lesser prairie-chickens, especially when it followed by intensive livestock grazing. Past herbicide treatment in areas managed with intensive livestock grazing systems resulted in little if any ground cover and almost no desirable ground vegetation. If herbicides are used to control shinnery oak, we recommend treatments be designed to only reduce the density of oak. We also recommend that areas dominated by shinnery oak be managed as a mosaic of treated and untreated areas.***

RESPONSE: The DEIS does not prescribe the eradication of shinnery oak. Instead, it recommends a reduction of shinnery oak to a level of 40 percent composition, which is consistent with Desired Plant Community prescriptions. Therefore, shinnery oak habitats will not be eradicated. Instead, shinnery oak composition within existing habitat patches will be reduced to reflect those stated in Desired Plant Community objectives. In a typical treatment, features such as water locations, booming grounds, or other leave areas are buffered out and not treated, resulting in a mosaic effect across the landscape. After treatment to reduce shinnery oak, livestock grazing will not be allowed in these areas for two growing seasons or until grasses have recovered to meet Desired Plant Community objectives. When grazing is resumed, utilization levels will be designated to leave enough grass cover to meet special status species needs. Generally, utilization will not exceed 45 percent of current year's growth.

61. COMMENT: ***There is a lack of a consistent scale at which decisions will be made to treat shinnery oak habitat to improve habitat for the Lesser Prairie Chicken. The comment centered on two points, using a threshold of 40% shinnery cover by composition and at what scale treatments would occur. How appropriate is using relative cover as a metric when the reduction of grasses and forbs by livestock or drought conditions in a given area can change the relative composition of shinnery oak without it having increased. The issue of scale for treatment size centered on treatments continuing at a smaller and smaller scale until shinnery oak habitats have been fragmented into smaller and smaller patches.***

RESPONSE: The DEIS does not prescribe the eradication of shinnery oak. Instead, it recommends a reduction of shinnery oak to a level of 40 percent composition. Therefore, shinnery oak habitats would not be fragmented into smaller and smaller patches. Shinnery oak composition within existing habitat patches would be reduced to reflect those stated in Desired Plant Communities objectives. As to the scale of treatment, these projects are usually designed at the pasture level. An average treatment size is 2,500 to 3,000 acres. Non-target areas, such as occupied habitat, watering locations, etc. are avoided by 200 meters.

BLM uses a composition by cover method that records the next nearest perennial plant. This eliminates the fluctuation of relative cover caused by annual plant response to precipitation. An overview of long term monitoring studies shows shinnery oak composition remaining relatively constant. Grasses such as bluestems and dropseeds had composition fluctuations from five to 13 percent. These figures come from studies conducted for over twenty years to incorporate effects of precipitation and different grazing practices. BLM believes the method currently used to obtain cover by composition values is the least susceptible to large changes that can be caused by dry or wet years and more closely reflects existing composition than other techniques.

LIVESTOCK GRAZING

62. COMMENT: ***Will the vegetative requirements (primarily nesting habitat) for the lesser prairie-chicken be used as parameters to evaluate the Standards for Public Land Health? If so, the decisions of meeting the Standards may change and we would value that as a high concern.***

RESPONSE: The vegetative requirements (primarily nesting habitat) for the lesser prairie-chicken will continue to be used as one parameter to evaluate the standards. This has been done prior to the Resource Management Plan Amendment and would have continued even without the Amendment. There will be no more emphasis placed on this indicator than any other; each indicator contributes equally towards a Standards Determination. In addition, the determination indicates if additional information (monitoring) is needed to identify the cause of the resource problems. In the Pecos District, the existing long term rangeland monitoring program will continue to be used to decide if a grazing management change is warranted and what type of change it will be. This will involve consultation, coordination, and cooperation with the grazing permittee and other interested publics.

63. COMMENT: ***On page 2-17, delete fence exclosures around lesser prairie chicken booming grounds.***

RESPONSE: BLM agrees that fences around lesser prairie chicken booming grounds could be detrimental to these birds. The paragraph in question discusses techniques to improve special status species habitat and is intended to outline various methods to protect or enhance this habitat. While the statement was not meant to say booming grounds will be fenced, it can be interpreted as such. The following statement will be added: "If it is determined that a booming ground needs to be fenced, mitigation measures such as anti-perching structures and fence markers would be used."

64. COMMENT: ***All pastures with 25% or more shinnery be rested 12 months at a time for one year out of three***

RESPONSE: On smaller allotments in "shinnery country", this type of rest could remove a large part of the allotment from use, putting a financial burden on the permittee. For example, on a six pasture allotment, with all six pastures having greater than 25 percent shinnery, in any given year two pastures would

have no livestock in them. One third of the allotment would not being grazed. As an alternative, following a grazing scheme that provides growing season rest in two or three pastures would allow grasses needed for nesting/rearing cover to be produced. These pastures could then be grazed in the dormant season, after chicks have been hatched. Utilization levels during this dormant season use would be set to provide enough standing cover for rearing habitat. This type of use can be particularly effective by focusing the growing season rest in pastures that have occupied habitat or are adjacent to occupied habitat.

Another grazing scheme that can enhance recovery is allowing pastures to be stocked lightly, at a use level use of no more than 30-35 percent for example. This would provide necessary habitat requirements and keep the permittee in business. Not all pastures with this amount of shinnery may have lesser prairie-chicken potential, so total rest for a year may not be needed. Not all pastures may be stocked at a level to reduce nesting/rearing cover. Also, during dry spells, many permittees voluntarily reduced numbers, which helps achieve the nesting/rearing cover requirements.

By following grazing systems that provide growing season rest in critical pastures and prescribing use levels that meet habitat requirements, grazing use can continue while enhancing lesser prairie chicken recovery. A blanket grazing requirement that any pasture with greater than 25 percent shinnery being rested 12 months in a row one year out of three is burdensome on the grazing permittee and may or may not enhance nesting/rearing success.

65. COMMENT: ***What is the total number of AUMs that would be reduced in the Planning Area?***

RESPONSE: There are several different numbers that could answer the question above, each related to one of the Alternatives. These are discussed below:
No Action - 638 cows (see discussions on page 3-17, where the potential reductions are based on impacts to livestock numbers in the 1999 EIS for Standards Assessments)

Alternative A - a low end of 836 cows (see discussion on page 3-17, based on voluntary non-use already taken in the Roswell Field Office) and a high end of 1,672 cows (based on the same adjustments being implemented in the Carlsbad Field Office as were implemented in the RFO)

Alternative B - same as A

Alternative C - same as A

Alternative D - 836 cows (based on voluntary non-use reductions already taken in occupied habitat in the RFO and no additional adjustments in Carlsbad Field Office since there is no occupied habitat)

Alternative E – 638 cows in the Planning Area outside the proposed ACEC and 3,043 cows for five years within the moratorium area of the proposed ACEC. (See discussions in Chapter 4.)

The numbers above are an attempt to give a reasonable range. Actual changes would depend on monitoring study data, Robel data, and Standards Assessments. Also, the amount and timing of precipitation may reduce or increase the numbers.

66. COMMENT: ***The DEIS would preserve the present grazing regime.***

RESPONSE: BLM disagrees and believes the DEIS would not necessarily maintain existing livestock grazing

systems on allotments within the Planning Area. Each field office in the Planning Area already has planning documents covering rangeland monitoring, livestock adjustments based on monitoring, and assessments of Rangeland Health. If monitoring or assessments indicate a change in livestock grazing is needed to protect special status species, or to meet Rangeland Health Standards, then the present regime would change. Typically, these changes are pursued first through negotiation and concurrence with the grazing permittee/allottee, which can be considered voluntary. If a range use agreement cannot be reached, then a decision is issued, which is a mandatory change.

67. COMMENT: ***Alternative A states voluntary conservation actions would also be monetarily compensated by the BLM. Grazing on public lands is a privilege, not a right, necessary grazing reductions should be mandatory, and not provide additional revenue to permittees.***

RESPONSE: Alternative A does not make this statement. Alternative A discusses compensation for voluntary conservation action and on page 2-38 states that the BLM has no such program currently, but funding may be provided by other private, State, or Federally funded programs. Alternative A further states these programs may offset some of the conservation costs.

68. COMMENT: ***Livestock grazing and related infrastructure (e.g., fencing) is a significant threat to lesser prairie-chickens, not addressing this threat is a fatal flaw of the document, and BLM concludes, without basis, that no long term impacts are expected as a result of the livestock grazing program as proposed. See DEIS at p. 4-11.***

RESPONSE: To date, neither field office has received a documented report of fence induced mortality to chickens. A dataset from Sutton Avian Research Station in New Mexico shows that fence *and* power line collisions account for only 14 percent of the mortality in Roosevelt County, New Mexico (GMSARC unpublished data, Donald H. Wolfe October 16, 2003).

On page 4-11 the DEIS concludes no long term impacts are expected as a result of livestock grazing, "as proposed." The DEIS proposes a continuation of monitoring, implementation of livestock adjustments (changes in numbers and/or grazing schemes), and based on this monitoring, treatments to the landscape to achieve Desired Plant Community. The combination of these would lead to no long term negative impacts to lesser prairie-chickens.

69. COMMENT: ***BLM should conduct the Standards Assessments more vigorously across the planning area. We recommend livestock grazing be suspended in lesser prairie-chicken nesting areas for five years, while all grazing allotments in the planning area undergo assessment.***

RESPONSE: To complete assessments on all allotments in the planning area in the same five year period would be difficult, given existing priorities, staff, and budget. However, even without the DEIS, BLM can alter livestock grazing practices at any time if it is determined a change is needed. A five-year grazing moratorium was analyzed in Alternative E.

70. COMMENT: ***The DEIS states the 17 Habitat Evaluation Areas (HEAs) within the Isolated Population Area these areas would be prioritized for reclamation potential and for potential to re-established connectivity to adjacent isolated habitat clocks. Until the evaluation of an area is complete, new oil and gas leasing would be deferred. BLM should establish reasonable timeframe to conduct the evaluation of these 17 areas and consider leasing these lands with a NSO stipulation. If at a later date after the evaluation is completed it is determined that there are drilling location within this area the stipulation can be waived.***

RESPONSE: An HEA meeting the criteria in Appendix 8 would constitute an Area that could be closed for leasing or leased with an NSO where appropriate. The evaluation of the 17 HEAs has not been completed.

Priority areas by name, year and acres:

HEA Name	Total Acres	Unleased Federal Minerals Acres
Eunice (Year 1)	7,661	530
Skeen (Year 1)	2,939	0
QP-A (Year 1)	7,595	160
QP-C (Year 1)	3,097	0
Southpaw (Year 1)	3,054	180
Bilbrey (Year 1)	5,328	1,080
WIPP (Year 2)	24,738	12,984
Mills (Year 2)	2,585	160
QP-D (Year 2)	1,972	0
QP-F (Year 2)	2,909	1,264
QP-B (Year 2)	598	0
Mescalero Sands (Year2)	9,347	520
Pearl (Year 3)	3,234	1,520
San Simon (Year 3)	10,702	2,680
Loco Hills (Year 3)	8,839	160
Paduca (Year 3)	15,167	2,480
Laguna (Year 3)	3,289	360
TOTALS	**113,053**	**22,558**
Year 1 = 6 HEAs= 29,674 acres; Year 2 = 6 HEAs= 42,148 acres; Year 3 = 5 HEAs= 41,230 acres.		

71. COMMENT: ***On page 2-17 the DEIS states: "Surface disturbance would not be allowed on public land within known prairie dog towns or towns identified in the future." We suggest adding the word "active" between the words within and known.***

RESPONSE: This text cited is a direct quote from existing land use plans. BLM has identified and mapped active prairie dogs towns within the Pecos District. BLM has always inferred active prairie dog towns when applying this prescription.

72. COMMENT: ***On page 2-26, insert "active" leks at the time of permitting. There are numerous leks that were active at one point in time have not been active since. If the lek has not been active within the past two years then the 200 meters is not necessary.***

RESPONSE: Page 2-26 is part of the No Action Alternative and describes current management. This portion of the text is taken directly out of existing plans. Inserting "active" would change No Action and would not, therefore, be an accurate representation of existing plans or serve as a baseline for comparison with other alternatives.

73. COMMENT: ***Existing timing stipulations within the Planning Area would continue to protect lesser prairie-chickens during the spring mating period and nesting phase. No scientific data was presented in the Draft RMP/EIS to justify the increase of the timing stipulation by fifteen days to the beginning of March in Alternative B. Female lesser prairie-chickens attend leks typically from late March to May and the nesting phase extends through May and early***

June (Giessen 1998, Bidwell et al. 2001), therefore the increase in the timing stipulations is completely unnecessary and will by highly disruptive for the industry in planning for and carrying out the long term, capital-intensive process of lease acquisition and development.

RESPONSE: There is information that shows that male chickens start to congregate at the lek in late February to establish dominancy and a hierarchy for mating. The timing limitation is justified in allowing males to congregate in areas that are used as leks. BLM has taken a stance to extend the timing stipulation to March 1st in Alternative B to afford protection to the males at the lek locations to establish the breeding hierarchy.

74. COMMENT: ***Timing and noise stipulations should be imposed only in areas where lesser prairie-chickens are present, as indicated by sightings or survey reports within a period of 2 years.***

RESPONSE: The DEIS states in Alternatives A and B the timing and noise stipulation would be applied in areas where chickens are present based on survey data, 2 years for sightings. Alternative B adds a five-year period for active leks.

75. COMMENT: ***There is support for the captive propagation and reintroduction program of lesser prairie-chickens with the exception of the use of potash enclaves as potential breeding facilities and lesser prairie-chicken reserve areas for the reintroduction of this species. The oil and gas industry has been working with BLM in the past twelve years in establishing concurrent operations between oil and gas and potash deposits within the designated potash areas to maximize the recovery of both resources. Using the potash enclaves as part of this program will add more complexity to these negotiations.***

RESPONSE: BLM appreciates the support for a captive propagation program. The DEIS, however, simply states BLM support for propagation and transplanting lesser prairie-chickens within the Planning Area. The DEIS does not discuss prospective release locations. Decisions regarding prospective release locations would be made in the future after consultation with other Federal and State agencies, local governments, affected land owners and private industry.

76. COMMENT: ***No definition for suitable sand dune lizard habitat was found under Alternative B and, therefore, it is uncertain which definition was used to designate the lizard habitat area under the preferred alternative. The only definition found in the DEIS was in the Working Group conservation Strategy (Appendix 2) on page 127 states: "suitable habitat is any mosaic of shinnery oak dune habitat types within 20 km (12.4 miles) of an occupied site measured from the outer edge of that contiguous habitat site." The use of 20km in the mapping of dune areas is erroneous making it absolutely necessary to reevaluate the current proposed lizard habitat boundaries.***

RESPONSE: BLM agrees the 20km distance is problematic and did not include this definition of either Alternative A or Alternative B. Alternative B focuses on dune complexes instead of the definition found only in Appendix 2. By focusing on dune complexes BLM's intent is to apply protective measures only where necessary.

It was not BLM's intent to portray the Sand Dune Lizard Habitat area depicted by the green line on Map B-1 as contiguous occupied or suitable habitat. BLM understands the Sand Dune Lizard Habitat area contains many acres that could be developed for oil and gas without impacting occupied and suitable sand dune lizard habitat.

77. **COMMENT:** ***The definition of occupied lesser prairie-chicken habitat is listed in the DEIS as being all areas within 1.5 miles of an active lek site, regardless of vegetation. Also, upon discovery of previously unknown active sites, the surrounding 1.5 mile radius circle is considered occupied habitat. Timing restrictions should be imposed on a much smaller area (such as ¼ mile from the lek) from mid-March to June 1 with daily operational restrictions (no operations or human presence until after 9:00 am) to provide sufficient opportunities to use and develop oil and gas resources. The implementation of this definition will have a negative impact upon exploratory and in-fill development opportunities. It is important to remember that fifty percent of the natural gas produces today comes from wells drilled in the last four years.***

RESPONSE: The definition of occupied habitat in association to a lek or sighting was agreed upon by the members of the Working Group which included representatives of environmental organizations and the petroleum industry. The 1.5-mile distance was based on nesting studies performed in Kansas, New Mexico, and Oklahoma.

78. **COMMENT:** ***Alternative B, Sand Dune Lizard – New Oil and Gas Leasing. The sand dune lizard habitat boundary covers a large amount of land that is not considered shinnery oak dune habitat. We believe that BLM needs to further evaluate this boundary and only include within the boundary lands that are considered shinnery oak dune habitat.***

RESPONSE: It was not BLM's intent to portray the Sand Dune Lizard Habitat area, depicted by a green boundary line (see Map B-1), as contiguous occupied or suitable habitat. BLM understands the Sand Dune Lizard Habitat area contains many acres that could be developed for oil and gas without impacting occupied and suitable sand dune lizard habitat.

79. **COMMENT:** ***According to the DEIS, predator control will continue unchanged under the proposed alternative (and all of the alternatives considered). See DEIS at p. S-11. This will likely harm and further imperil the Swift Fox. BLM should disclose these impacts and consider alternatives which decrease or eliminate lethal control of native species.***

RESPONSE: The impacts of predator control were disclosed and analyzed in the 1997 Roswell Resource Management Plan. This DEIS proposes no changes regarding predator control. Therefore, further analysis is unnecessary. The swift fox was removed from consideration for listing under the Endangered Species Act in 2001 and the species does not meet the definition of a special status species.

80. **COMMENT:** ***We appreciate that the proposed alternative increases the areas in which timing and noise exceptions would not be granted (See DEIS at p. 4-40), but we are concerned that failure to conduct adequate surveys for lesser prairie-chickens in Sparse and Scattered Population Area and Isolated Population Area will result in exceptions that may lead to increased areas from which the lesser prairie-chicken will be extirpated.***

RESPONSE: The Pecos District has a very aggressive survey pattern in both the Sparse and Scattered Population Area and the Isolated Population Area. BLM staff conducts chicken surveys using protocol designed by the New Mexico Department Game and Fish (see Appendix 6, Monitoring and Implementation). As with all BLM programs, interested members of the public are always welcome to accompany BLM staff as it conducts surveys.

81. **COMMENT:** ***See DEIS at pp. 2-34 to 2-35. The DEIS will not adequately protect sand dune lizard habitat. Well pads could be constructed in suitable lizard habitat at the level of 13 pads per section and repeated seismic exploration by thumper trucks would be allowed. This is despite scientists' urging protection from oil and gas activities of lizard occupied, potential, and nearby habitat, given the dynamic and shifting nature of sand dune lizard habitat.***

RESPONSE: In Alternative A there is a threshold of 13 wells per square mile. The New Mexico Department of Game and Fish study indicates that when development reaches 13 wells per square mile, the population of sand dune lizards drops approximately 25 percent. Within the US Fish and Wildlife Service, the lizard has a higher priority for potential listing as threatened or endangered than the chicken. In BLM's judgment, possible reduction in lizard populations by 25 percent is not consistent with the goal of preventing the lizard from being listed while allowing other activities to continue. BLM believes Alternative B, the preferred alternative, establishes a process that allows development while protecting lizard habitat and, therefore, lizard populations. In Alternative B, after analysis of dune complexes is conducted, lessees may not be able to reach this type of development within lizard habitat. On the converse, companies may be able to develop an area to its fullest potential through a plan of development, which is proprietary information and not available for release, within lizard habitat. There are protective measures to avoid dune complexes by up to 200 meters. The dunes that make up lizard habitat take hundreds of years to move inches.

82. **COMMENT:** ***We are generally concerned that the proposed alternative will fail to limit the landscape level trend of habitat fragmentation that is imperiling the sand dune lizard and lesser prairie-chicken. More specifically, while the proposal includes timing restrictions on some oil and gas operations and off-highway vehicle use, these mitigations are subject to exceptions and waivers, and their enforceability is doubtful.***

RESPONSE: Alternative B is very specific about when and where exceptions for oil and gas operations would be considered. Through cooperation and communication with groups much can be accomplished. BLM, over the past two years, has had great success coordinating with companies to plan around the timing area allowing for breeding activities to take place uninterrupted. In the Pecos District, patrol of recreation areas, including OHV areas, is a priority for BLM Rangers. While the focus of BLM law enforcement is educating the public regarding permitted uses on public land, BLM Rangers are authorized and do issue citations for violations.

83. **COMMENT:** ***We recommend that the Core Management Area be permanently closed to new leasing, with no exceptions and no termination if the sand dune lizard or lesser prairie-chicken are removed from the ESA candidate list.***

RESPONSE: A permanent closure was analyzed in Alternative C. Zone1 of Alternative C includes the acreage of the CMA and would be closed to new oil and gas leasing with no exceptions. The prescriptions of Alternatives A and B allow management adaptability and flexibility should one or both species be dropped from candidate status. BLM would continue to apply lease stipulations and conditions of approval in order that neither species would return to candidate status.

84. **COMMENT:** ***BLM should require reclamation efforts in areas that will contribute to assembling or expanding blocks of suitable habitat of at least 8,000 acres in size***

particularly in the Carlsbad Field Office portion of the Planning Area.

RESPONSE: BLM has already targeted areas for reclamation within the Planning Area. Some areas are in occupied habitat and others are in historic areas where chickens have been documented with in the last 2 years. In the Carlsbad Field Office portion of the Planning Area, blocks of habitat greater than 8,000 acres in size are rare. The DEIS is using a building block concept to expand smaller blocks of suitable habitat into larger blocks of suitable habitat. In conjunction with these building blocks BLM is also looking at connectivity to other suitable habitats for chickens and the creation of corridors for passage. These have been prioritized and work has already started. BLM cannot require these efforts, however; through coordination, communication, and consultation with companies BLM has had great success in reclamation efforts to date.

85. COMMENT: ***Authorize energy development no closer than 3 miles from any lek that has documented use by lesser prairie-chickens within the past 5 years.***

RESPONSE: The definition of occupied habitat in association to a lek or sighting was agreed upon by the members of the Working Groups which included representatives of environmental organizations and the petroleum industry. The 1.5-mile distance was based on nesting studies performed in Kansas, New Mexico, and Oklahoma.

86. COMMENT: ***Energy lease stipulations must be maintained as needed on existing leases to maintain conditions suitable for lesser prairie-chickens; particularly time and noise stipulations within 3 miles of existing lesser prairie-chicken leks.***

RESPONSE: See the Response to the previous Comment.

87. COMMENT: ***On page 2-41, the timing stipulation should only apply in the management zones, Habitat Evaluation Areas until they have been evaluated or other occupied sites and not "where species habitat is present."***

RESPONSE: BLM agrees and the word habitat has been dropped in the text.

88. COMMENT: ***On page 2-41, the reference to historic leks should be deleted. There are historic leks scattered throughout the planning area, but landscapes have changed (shinnery oak treatments, oil and gas development, grazing use) overtime and these leks may not become active again.***

RESPONSE: BLM, in conjunction with Auburn University, have found that there are five areas that were thought to be inactive now have chicken activity in very close proximity as of the 2006 survey year. BLM believes that it is justified to allow the historic leks some level of protection during the breeding season. These historic leks were once considered the core area for chicken in what is proposed to be the Isolated Population Area.

89. COMMENT: ***Pages 2-41 and 2-42, Exception #2, this should be 3 years and Exception #4, why continue timing stipulation if area evaluated does not meet habitat standards?***

RESPONSE: Exception #2 will not change as 5 years was agreed upon in the Working Group - 5 years for a lek and 2 years for a sighting. BLM has clarified Exception #4 to say exceptions would be granted for Habitat Evaluation Area that do not meet the evaluation criteria.

90. COMMENT: ***Direct mortality from power lines is minimal to lesser prairie-chickens. These structures may cause habitat by fragmentation (.25 mi), but there are other things like fence collisions that have more of***

a negative impact (38% of mortality in New Mexico). In sand dune habitat, the effect on burying miles and miles of power-lines could have a greater impact on lizards than the overhead power-lines do to chickens.

RESPONSE: A dataset from research in New Mexico shows that fence and power line collisions account for only 14 percent of the mortality in Roosevelt County, New Mexico (GMSARC unpublished data). Donald H. Wolfe October 16, 2003.

Burying power lines is only one option of reducing habitat fragmentation in chicken habitat and there will be situations where habitat protection requirements for the chicken may appear to be in conflict with those for the lizard. The preferred alternative has provisions for plans of development (PODs) which provides a mechanism for BLM and industry to develop solutions to these apparent conflicts.

CULTURAL RESOURCES AND PALEONTOLOGY

91. COMMENT: ***On page 2-19, Under Paleontology, Delete "where geology is conducive to finding fossils". When construction workers find these resources they are required to stop and report.***

RESPONSE: Based on comments received BLM has revised this section which now states: "Where fossil locations are known or where significant or important fossils are discovered, a qualified paleontologist would perform a literature and records search, conduct a field survey and report the findings prior to the BLM authorizing surface disturbance."

92. COMMENT: ***Although there is discussion of current management of cultural resources and planned management under the various alternatives, it is somewhat difficult to discern whether there would be an overall change in management under any or all of the alternatives. A brief statement reiterating this point in the Executive Summary would be helpful to the reader.***

RESPONSE: Cultural resource management remains the same for current management and for all of the alternatives. The amount of potential damage to cultural resources from a variety of sources will vary by alternative because each alternative allows differing amounts of surface disturbance. The more surface disturbance, the more likelihood there is for impacts to cultural resources.

93. COMMENT: ***On page 2-8, the term should be Advisory Council on Historic Preservation, not "American Council".***

RESPONSE: This error has been corrected.

94. COMMENT: ***In Summary Tables, it is not apparent how the indirect effects on cultural resources were quantified. Some explanation in the text is needed as to what constitutes, for example, "20% less indirect impacts". The document is currently unclear on this point and clarifying information should be added.***

RESPONSE: Each of the alternatives has its own level of predicted surface disturbance. The assumption here is that the more predicted surface disturbance there will be, the more indirect impacts there will be on cultural resources.

95. COMMENT: ***The text in Chapter 4 addresses only traditional cultural properties (TCPs). There are many other types of resources that could be affected by the various alternatives. These should be discussed at least in summary in this section so that the totality of cultural resource types that are part of the affected environment can be reviewed.***

RESPONSE: The range of cultural resources in the planning area includes prehistoric sites: paleoindian, archaic and formative or ceramic. There are also protohistoric and historic sites. There may be traditional cultural properties and sacred sites in the planning area but the BLM has received no information concerning these from Native American Tribes who once lived here.

OFF-HIGHWAY VEHICLES

96. COMMENT: ***The DEIS understates the impacts to lesser prairie-chickens and sand dune lizards from off-highway vehicles by stating that these species are mobile and can therefore flee from vehicles. See DEIS at p. 4-38. The agency has therefore failed to take a hard look at the damage to habitat, disturbance to wildlife and plants, and vehicular collisions that can occur due to this activity, to the detriment of the species this RMPA is supposed to conserve.***

RESPONSE: The DEIS, on page 4-38 states:

> *"Possible impacts associated with OHV expansion within the Planning Area for lesser prairie chicken would be minimal at best. Impacts would be associated with the duration of use in an area and impacts would be directly tied to the area being used. Wildlife species that are highly mobile, such as the lesser prairie chicken, would evacuate the area during times of OHV use, and potentially return to the area once activities have ceased. Potential impacts to sand dune lizards would be minimal as well. Sand dune lizards are a mobile species that utilize sand and shinnery oak for cover. Impacts would be associated with the duration of use in an area and impacts would be directly tied to the area being used. Due to the nature of the sand dune lizard and the habitat requirements of shinnery oak overhangs and the avoidance of open un-vegetated dunes impacts would be minimal."*

Prior to the release of the DEIS, BLM staff biologists and recreation planners conducted preliminary surveys of existing and potential OHV areas within the Planning Area to determine the level of potential conflicts between OHV use and other resources. These surveys indicated the proposed expansion of the Mescalero Sands North Dune OHV and the proposed Square Lakes OHV Area could go forward with the criteria detailed in Alternative B due to the absence of chickens and lizards in these areas. The text in the FEIS has been amended to include this preliminary information.

97. COMMENT: ***The planning area contains 847,491 acres of BLM surface land, and under the proposed alternative, 843,000 acres would remain open to OHV use on designated roads and trails. It is unclear, however what the impact would be spatially, given that the travel planning has not yet been completed. See DEIS at page S-13 Regardless, this proposal leaves over***

99% of the planning area open to OHVs.

RESPONSE: The definitions of OHV designations, open, limited, and closed, are specific and can be found in the Glossary of the DEIS. Alternative B, the preferred alternative, proposes to designate 843,000 acres as limited to existing roads and trails. Only 1,000 acres would be designated as open to OHV use and these acres are unsuitable sand dune lizard habitat. This is in stark contrast to No Action (current land use plans) in which 586,000 acres are designated as open to OHV use and 258,000 acres designated as limited to existing roads and trails.

The designation of limited to existing roads and trails is an interim step. In the future, BLM will designate roads and trails for OHV use in transportation planning. The text in the Executive Summary has been amended to clarify this.

98. COMMENT: ***Alternative B would triple the size of the Mescalero Sands North Dune OHV Area (from 562 acres to 1674 acres), would continue authorization of the 55,800 acre Hackberry Lake Intensive OHV Area for this land use, as well as establishing the Square Lake OHV Area.***

RESPONSE: The criteria for expansion are; (1) an increase in public use/demand and; (2) no conflicts with chicken or lizard habitat. Both criteria have to be met before any phase of the expansion would occur. The impacts of expanding the Mescalero Sands North Dune OHV Area have already been analyzed in the 1997 Roswell Resource Management Plan (RMP). This DEIS identifies and analyzes the impacts of the criteria for the possible three-phase expansion of this OHV area.

A portion of the Hackberry Lake Intensive OHV Area (22,673 acres) is located within the Planning Area. Alternative B proposes to change the OHV designation of that portion by designating 22,541 acres as limited to existing trails with the remaining acres (132) designated as open to OHV use.

The criteria for establishment are; (1) an increase in public use/demand and; (2) no conflicts with chicken or lizard habitat. Both criteria have to be met before this OHV area would be established. The area that Alternative B proposes to establish as the Square Lake OHV Area is currently being used by the public for OHV recreation with no management control. Alternative B establishes criteria that must be met before the OHV is established. The establishment of Square Lake OHV Area would allow BLM the opportunity for management of this area. This DEIS identifies and analyzes the impacts of the criteria for the possible establishment of this OHV area.

99. COMMENT: ***The DEIS acknowledges that OHV use is increasing in the BLM's Pecos District, but has failed to adequately disclose the impacts of this land use on special status species.***

RESPONSE: BLM acknowledges that increased OHV use is likely to continue within the Planning Area. Impact analysis is found in Chapter 4 of the DEIS and BLM believes it has adequately disclosed the impacts of OHV use on special status species.

By using multiple land use designations, BLM can provide a quality motorized experience in certain areas while still meeting conservation goals and requirements. The lesser prairie-chicken and sand dune lizard are candidate species under the Endangered Species Act. As a

candidate species, neither species is eligible for full protection under ESA. Therefore, protection of chicken and lizard habitat is not a legal matter but a matter handled under BLM policy.

It is BLM's policy to manage public land and resources in such a manner so that it is not necessary to list the lesser prairie-chicken or the sand dune lizard. The purpose of this resource management plan amendment (RMPA) is to put into place management prescriptions that would avoid the necessity of listing either the sand dune lizard or the lesser prairie-chicken while allowing existing activities on public land to continue. BLM believes the implementation of this RMPA will accomplish this purpose.
BLM, through the EIS, would monitor designated OHV activity and visitor use to evaluate the impacts to special status species and their habitat for the purpose of giving managers the necessary information to make decisions. BLM believes this management component represents a balanced approach to our multiple use mandates, and a reasonable decision making tool to protect special status species habitat.

100. COMMENT: ***The discussion of the expansion of the Mescalero Sands North Dunes and creation of Square Lake OHV Area on page 2-51 of the DEIS states that lesser prairie-chicken and sand dune lizard surveys would be conducted to determine if conflicts would occur, but no information is given on what level of "conflict" would preclude the expansion of Mescalero Sands North Dune and creation of Square Lakes OHV Areas.***

RESPONSE: Any conflict would preclude either the Mescalero Sands North Dune OHV Area expansion or establishment of Square Lake OHV Area. Prior to the release of the draft document, BLM staff reported no conflicts with special status species or their habitat. Before expanding any phase of Mescalero Sands North Dune OHV Area, the acreage would be surveyed again to ensure that conflicts do not exist with special status species or their habitat. Before establishing Square Lake OHV Area, the acreage would be surveyed again to ensure that conflicts do not exist with special status species or their habitat.

101. COMMENT: ***Based on the known occurrence of the lizards in Sand Dune Lizard Habitat Area as indicated by Maps A-1 and B-1, and the location of Mescalero Sands North Dune and proposed location of the Square Lakes OHV Areas within the Sand Dune Lizard Habitat Area, we do not believe the expansion of Mescalero Sands North Dune and creation of Square Lake OHV Areas can avoid surface disturbing activities and therefore negative impacts to the lizard in occupied and suitable dune complexes where the lizard is known or expected to occur.***

RESPONSE: It was not BLM's intent to portray the Sand Dune Lizard Habitat area (see Map B-1) as contiguous occupied or suitable habitat. BLM understands the Sand Dune Lizard Habitat area contains many acres that are neither occupied nor suitable lizard habitat.

Prior to the release of the draft document, BLM staff biologists reported no conflicts with special status species or their habitat. As stated above, the acreage would be surveyed again to ensure that conflicts do not exist with special status species or their habitat before either expansion or establishment of new OHV areas would occur.

102. COMMENT: ***We are concerned about the ability of the BLM to enforce OHV restrictions and limitations (i.e., restricted to existing routes and trails versus open to overland travel).***

RESPONSE: Every established recreation area, including OHV areas, must have a recreation area management plan (RAMP). This resource management plan amendment would amend the RAMP for the Mescalero Sands North Dune OHV Area.

Should the criteria be met to establish the Square Lake OHV Area, BLM would develop a RAMP (would include route designation) and the impacts would be analyzed in a National Environmental Policy Act (NEPA) document. Once the RAMP is completed, implementation would include marking designated trails and developing maps of the trails within the area.

After recreation areas are established, enforcement is a function of BLM Rangers. In the Pecos District, patrol of recreation areas, including OHV areas, is a priority for BLM Rangers. While the focus of BLM law enforcement is educating the public regarding permitted uses on public land, BLM Rangers are authorized and do issue citations for violations.

RECREATION

103. COMMENT: ***Why is there a no surface occupancy (NSO) requirement for the entrance corridor to Mescalero Sands North Dune OHV Area? The BLM can require a location to be 200 meters either side of the entrance road. And if this decision is carried forward then the size of corridor needs to be explained.***

RESPONSE: The NSO requirement for the entrance corridor for the Mescalero Sands North Dune OHV Area was established by the 1997 Roswell Resource Management Plan (RMP). The size of the corridor was also established by the 1997 Roswell RMP and is represented as Phase 1 on Map B-3.

104. COMMENT: ***On page 2-24, under Visual Resources, what is meant by texture?***

RESPONSE: Since there is no definition for texture in Visual Resources, the term has been dropped from the text.

SOCIO-ECONOMIC CONDITIONS

105. COMMENT: ***One of the biggest flaws is the measure of economic impact from personal income. The variable and attributes [of the Economic Profile System] are not adequate, therefore no true conclusions can be made to the potential impact this could have on the local communities in SE New Mexico or to the entire state.***

RESPONSE: The Economic Profile System (EPS) is not a model used to measure economic impacts. EPS was developed to produce standardized economic and demographic profiles for a selected region, county, or community in any of the 50 states. EPS profile information for the four counties of the Planning Area is presented in Chapter 3, Affected Environment. Chapter 3

describes the physical, biological, social and economic characteristics of the Planning Area that influence the resolution of planning issues that affect or are affected by the alternatives described in Chapter 2. The description of the affected environment serves as a baseline for analyzing and determining the effects on resources from various alternatives. The socio-economic impacts of each alternative are discussed in Chapter 4.

106. COMMENT: ***Chapter 3 states that the share of total employment and personal income generated by the ranching and oil and gas industries has declined in southeast New Mexico over the past 30 years. This statement is in error based upon the increase on the price of oil and gas since the 1970s.***

RESPONSE: The employment and income information used in Chapter 3 was gathered by the Bureau of Economic Analysis, US Department of Commerce. From 1970 to 2000, the number of people employed in the Farm and Agricultural Services category declined independently of the prices of oil and gas. This category's share of total employment also declined during this time period. From 1970 to 2000, the number of people employed in the Mining category, which includes oil and gas employment, stayed roughly the same with fluctuating highs and lows, dependent on the prices of oil and gas. This category's share of total employment, however, declined during this time period. Other categories of employment grew at faster rates during this period.

The personal income figures used in Chapter 3 have been adjusted for inflation so that the figures compare equal dollars. Again, from 1970 to 2000, personal income earned in the Farm and Agricultural Services category rose, however, its share of total personal income declined. The same thing happened to personal income in the Mining category, personal income rose while its share of the total personal income declined. Personal income from other categories grew at faster rates during this period.

107. COMMENT: ***The Economic Profile System (EPS) used in Chapter 3 under-represents direct employment in the oil and gas industry in southeast New Mexico as well as those employed in related occupations. BLM should use more recent figures from the New Mexico Department of Labor.***

RESPONSE: BLM used the most recent data available at the time the DEIS was developed. Both EPS and the NM Department of Labor use the North American Industry Classification System (NAICS) for classifying employment categories. The most recent employment data available in EPS is from 2004. For 2004, both EPS and NMDL report comparable employment data in southeast New Mexico. See also Response to the following Comment.

108. COMMENT: ***BLM should include recent local and state figures for economic planning.***

RESPONSE: Chapter 3 does not purport to be an economic plan or an economic analysis. Chapter 3 describes the physical, biological, social and economic characteristics of the Planning Area and serves as a baseline for analyzing and determining the effects on resources from various alternatives. Data for this profile were obtained from four sources:

- Regional Economic Information System of the Bureau of Economic Analysis, US Department of Commerce

- Bureau of Labor Statistics, US Department of Labor
- County Business Patterns, Bureau of the Census, US Department of Commerce
- Bureau of the Census, US Department of Commerce

Many of the state and local sources of data, including New Mexico, do not include information on the self-employed or on the importance of non-labor income, such as retirement income and money earned from past investments. This can result in the underestimation of employment and total personal income, in some cases, by at least one-third. BLM believes EPS provides an adequate economic profile of the Planning Area covering the past 30 years.

109. COMMENT: ***In Chapter 3, BLM should account for the importance of the oil and gas industry to the economy of New Mexico.***

RESPONSE: As stated in the previous responses, Chapter 3 serves as a baseline to compare the impacts of the alternatives. BLM uses EPS to show long term (more than 10 years) economic and demographic trends in the Planning Area and surrounding communities. BLM has acknowledged the importance of the oil and gas industry in New Mexico throughout the DEIS. In Chapter 3, BLM has attempted to present the economic and demographic trends in an unbiased manner. BLM believes EPS provides an adequate economic profile and demonstrates economic trends without pointing at a specific industrial category or group.

110. COMMENT: ***EPS indicates that services are supplanting oil and gas and livestock grazing as drivers of the local economy. We note that lesser prairie-chicken provide an important ecotourism attraction in the southern plains. Milnesand, NM and Canadian, TX have organized festivals around chicken viewing that have been highly successful in economically diversifying these rural communities. BLM should include more adequate economic analysis to consider this information.***

RESPONSE: BLM understands the chicken festival that occurs near Milnesand is organized by the New Mexico Department of Game and Fish. Given the small size of Milnesand, an unincorporated area, the effects on the local economy of the two-day festival are absorbed by adjacent communities such as Tatum, NM and Portales, NM. BLM believes EPS provides an adequate economic profile of the Planning Area.

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